

## **II. 3.4. Description of each course – BASIS COURSES**

<b>Course</b>	<b>ENGINEERING OF PARTICULATE SYSTEMS</b>
<b>Lecturer</b>	<b>PhD. Marin Hraste, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. A.D. Randolph and M.A. Larson, Theory of particulate processes, Academic Press, London 1988.
2. N. Harnby, M.F. Edwards, A.W. Nienow, Mixing in process industry, Butterworths, London 1992.
3. A. Rushton, A.S. Ward, R.G. Holdich, Solid liquid filtration and separation technology, VCH Weinheim 1996.
4. J.P.K. Seville, U. Tuzun, R. Clift, Processing of particulate solids, Chapman and Hall, London 1997.

### ***Course content***

Particle characterization, measurement, distribution and packing. Property functions. Population balances and theory of multidimensional particle distribution. Mixing and separation processes analysis: motion and flow of multiphase systems and flow in packing. Principles of fracture mechanics and comminution. Interaction in particulate systems as the foundation of the agglomeration processes. Equipment selection criteria based on inflow characteristics, physical principles, level of scrutiny and boundary conditions. An analysis of both, standard empirical methods for process design and definition of the process operating parameters. A multi-scale objective-oriented approach for the synthesis, simulation and development of processes.

<b>Course</b>	<b>CHEMICAL REACTOR ANALYSIS KINETIC MODELS</b>
<b>Lecturer</b>	<b>PhD. Zoran Gomzi, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. E. Bruce Nauman, "Chemical Reactor Design, Optimization and Scaleup", McGraw-Hill, New York 2002.
2. Z. Gomzi, "Kemijski reaktori", HINUS, Zagreb 1998.
3. L. M. Rose, "Chemical Reactor Design in Practice", Elsevier, Amsterdam 1981.
4. Hong H. Lee, "Heterogeneous Reactor Design", Butterworth Publishers, Boston 1985.
5. Rutherford Aris, "Mathematical Modeling Techniques", Dover publications, New York 1994.

### ***Course content***

An advanced study of the factors involved in the design and operation of chemical reactors for both homogeneous and heterogeneous system. This course integrates the concepts of chemical kinetics, mass and energy phenomena with those of conservation of energy and mass to form a basis for designing various types of reactors (both batch and continuous flow) for operation under both isothermal and nonisothermal condition. Development and application of mathematical techniques of particular interest for formulation of reactor models. Mass transfer with simultaneous chemical reaction and heat transfer will be examined with regard to their application to practical systems. Other topics include transient and steady – state operation, residence time distributions, stability and selectivity control.

<b>Course</b>	<b>CATALYTIC REACTION ENGINEERING CATALYSTS DEACTIVATION</b>
<b>Lecturer</b>	<b>PhD. Stanka Zrnčević, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. J.J. Carberry, Chemical and Catalytic Reaction Engineering, McGraw-Hill, New York, 1986.
2. Catalysis: An Integrated Approach, Eds. R.A. van Santen, P.W.N.M. van Leeuwen, J.A. Moulijn, B.A. Averil, Elsevier, Amsterdam, 2000.
3. Handbook of Heterogeneous Catalysis, Eds. G. Ertl, H. Knözinger, J. Weitkamp, VCH, Weinheim, 1997.

### ***Course content***

Introduction. Elements of heterogeneous catalysis. Heterogeneous catalysts phenomena. Inter-phase, intra-pellet and intra-reactor gradients (two-phase and multiphase systems). Criteria for the absence of transport limitations. Catalysis effectiveness factor. Experimental methods for determining: catalyst activity, effectiveness factor, effective diffusivity, mass transfer coefficient (gas-liquid, liquid-solid), holdup, interfacial area. Laboratory reactors: differential, integral, with recirculation. Preparation of solid catalysts: catalysts supports, deposition of active components, shaping of catalysts and supports.

<b>Course</b>	<b>ADVANCES COURSE IN BIOCHEMICAL ENGINEERING BIOCATALYSTS AND BIOTRANSFORMATIONS</b>
<b>Lecturer</b>	<b>PhD. Đurđa Vasić-Rački, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	Writing exam, oral exam

### *Literature necessary for course*

1. H.W.Blanch, D.S.Clark, "Biochemical Engineering", Marcel Dekker, New York, 1996.
2. J.E.Bailey, D.F.Ollis, Biochemical Engineering Fundamentals McGraw-Hill (1986).
3. A.Scragg ed. Biotechnology for Engineers - Biological Systems in Technological Processes, Ellis Harwood Limited, Chichester, (1988).
4. K.van't Riet, J.Tramper, Basic Bioreactor Design, M.Dekker, New York, (1991)

### *Course content*

Integrated bioprocesses. Macrokinetics. Bioprocess engineering: the critical times concept, relations between parameters, the optimization scheme.

Economic analysis of bioprocesses: components of the cost estimate, process flow sheets, material and energy balances in process design, equipment sizing. Capital cost estimates. Manufacturing cost estimates. Case studies: penicillin production, production of intracellular enzymes, phenylalanine production, production of vitamine C.

<b>Course</b>	<b>CHEMICAL ENGINEERING THERMODYNAMICS POLYMERITATION ENGINEERING</b>
<b>Lecturer</b>	<b>PhD. Marko Rogošić, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term,
<b>Lecture type</b>	Lectures, consultations, seminars
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. S.I.Sandler, Chemical and Engineering Thermodynamics, 3rd Ed., Wiley, New York, 1999.
2. J.M.Smith, H.C.Van Ness, M.M.Abbott, Introduction to Chemical Engineering Thermodynamics, 5th Ed., McGraw-Hill, New York, 1996.
3. J.M.Prausnitz, R.N.Lichtenthaler, E.G.de Azevedo, Molecular Thermodynamics of Fluid Phase Equilibria, 3rd Ed., Prentice Hall, Englewood Cliffs, 1999.
4. B.E.Poling, J.M.Prausnitz, J.P.O'Connell, The Properties of Gases and Liquids, 5th Ed., McGraw-Hill, New York, 2000.
5. D.Kondepudi, I.Prigogine, Modern Thermodynamics, Wiley, New York, 1998.

### ***Course content***

First and second law of thermodynamics, thermodynamic equilibrium, thermodynamic functions, stability criteria, ideal and real systems. Properties of real gases and gas mixtures: calculation of pressure, temperature, molar volume, fugacity, compressibility coefficient, enthalpy, entropy.

Properties of real solutions: standard states, calculation of excess functions and activity coefficients in polymer and electrolyte solutions; pressure, temperature and composition dependence. Phase equilibria: high pressure and high temperature vapor-liquid equilibria, solubility of gases, liquid-liquid equilibria in polymer and electrolyte solutions, solid-gas equilibria. Thermodynamics of irreversible processes, open systems, entropy production, phenomenological equations, Onsager reciprocal relations, Prigogine principle, diffusion and thermal diffusion processes, evolution of systems, Prigogine-Glansdorff theory of evolution.

<b>Course</b>	<b>SEPARATION PROCESSES</b>
<b>Lecturer</b>	<b>PhD. Aleksandra Sander, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. K. Satler, H.J. Feindt, Thermal Separation Processes – Principles and Design
2. J. M. Coulson, J.F. Richards, J.R. Backhurst, J.H. Harker, Chemical Engineering – Unit Operations
3. C. J. Geankoplis, Transport Processes and Unit Operations
4. J. H. Lienhard, A Heat Transfer Textbook

### ***Course content***

Principles of mass transfer: steady and unsteady state molecular diffusion; convective mass transfer; prediction of molecular diffusivities in gases, liquids and solids; overall and individual transfer coefficients. Thermal separation processes in vapor-liquid, liquid-liquid, solid-liquid, solid-gas-liquid systems: distillation, absorption, extraction, drying and crystallization. Theoretical and empirical description of processes. Selection criteria. Energy saving steps.

<b>Course</b>	<b>AN OVERVIEW OF MATHEMATICS FOR ENGINEERING</b>
<b>Lecturer</b>	<b>PhD. Ivica Gusić, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term,
<b>Lecture type</b>	Lectures, demonstrations
<b>Knowledge verification</b>	Writing exam, oral exam ,homework

### ***Literature necessary for course***

1. G.M. Philips, P.J.Taylor, Theory and applications of numerical analysis, Academic Press 1996.
2. Mathematica, <http://www.wolfram.com/>
3. E. Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons, Inc., 1998.

### ***Course content***

We study the basic concepts of algebra, linear algebra, geometry, analysis (differentiation, integration, ordinary differential equations, partial differential equations), numerical analysis, probability and statistics. We introduce the concept directly, through definitions, and illustrate them by simple examples (or by more sophisticated examples in some cases). After that we connect (some of) the concepts with concret problems in engineering as well as with their solving. Finally, we point out the procedures from Mathematica that are significant in numerical and symbolic operating with the concepts.

<b>Course</b>	<b>MATHEMATICAL MODELING</b>
<b>Lecturer</b>	<b>PhD. Želimir Kurtanjek, full professor</b>
<b>Institution</b>	Faculty of Food Technology and Biotechnology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam, seminar report

### ***Literature necessary for course***

1. J.R. Rawlings "Chemical Reactor Analysis and Design Fundamentals", Nob Hill Publishing Company, Madison, WS, 2002.
2. H.S. Fogler, "Elements of Chemical Reactor Engineering", Prentice Hall, Upper Saddle River, N.J., 1999.
3. W. E. Schiesser "Computational Mathematics in Engineering and Applied Science", CRC Press, Boca Raton, 1994.
4. R. Aris, "Mathematical modelling techniques", Pitman Advanced Publishing, London, 1988.
5. J.D. Seader "Computer Modeling of Chemical Processes", Monograph 15 of Series of American Institute of Chemical Engineers, New York, 1987.
6. J. Villadsen, M.L. Michelsen, "Solution of Differential Equation Models by Polynomial Approximation", Prentice Hall, Englewood Cliffs, 1977

### ***Course content***

The course provides students of chemical engineering with information on methodologies of mathematical modeling techniques and numerical methods with support of computer software. The course is based on systems view on modeling of chemical engineering processes. Methodological units are:

Fundamentals of systems view and mathematical modeling. Classification of mathematical models. Modern concepts in mathematical modeling. Neural networks. Fuzzy logic modeling. Chemometric models. Expert systems. Steady state models of chemical reacting systems. Multiplicity of stationary states. Numerical methods for stationary models. Methods of Jacobi, Newton, Wegstein, homotopy. Classification of dynamic models. Examples of nonstationary mass and energy balances for chemical reactors. Examples of software for chemical engineers: MatLab, *Statistica*, W.R. *Mathematica*, ASPEN, Super Pro-Designer.

<b>Course</b>	<b>TRANSPORT PHENOMENA DYNAMIC MODELLING OF DEEP BED FILTRATION</b>
<b>Lecturer</b>	<b>PhD. Antun Glasnović, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	12
<b>Course type</b>	Basis
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	1st term,
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	Writing exam, oral exam

### *Literature necessary for course*

1. J. R. Welty, E. E. Wicks, R. E. Wilson; Fundamental of Momentum, Heat and Mass Transfer, 2<sup>nd</sup> Ed., J. Wiley, New York, 1976.
2. R. P. Bird, W. E. Stewart, E. N. Lghfoot, Transport Phenomena, J. Wiley, New York, 1960.
3. R. S. Brodkey, H. C. Heshey, Transport Phenomena, Mc Graw-Hill, New York, 1988.
4. R. W. Fahrien, Fundamentals of Transport Phenomena, Mc Graw Hill, New York, 1983.
5. E. L. Cussler, Diffusion; Mass transfer in Fluid Systems, Cambridge University Press, Cambridge, 1984.

### *Course content*

Description of a fluid in motion, Lagrangian and Eulerian representation. Conservation laws. Equations of viscous flow. Dimensional analysis of the Navier-Stokes equation. Exact solutions of Navier-Stokes equations. Dynamic similarity in systems of various geometric characteristics. Velocity distributions with more than one independent variable; unsteady viscous flow. Boundary layer theory; Exact and approximate integral analysis of the hydrodynamic, thermal and concentration boundary layer. Convective heat and mass transfer correlations. Temperature and concentration distribution in turbulent flow. Unsteady heat and mass transfer. Differential equations of heat and mass transfer. Simultaneous momentum, heat and mass transfer.

<b>Course</b>	<b>TREATMENT PROCESSES OF WASTE SUBSTANCES</b>
<b>Lecturer</b>	<b>PhD. Felicita Briški, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2 nd term,
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	Writing exam, oral exam

### ***Literature necessary for course***

1. J. Casey, Unit Treatment Processes in Water and Wastewater Engineering, John Wiley & Sons, New York, 1995.
2. W. Bitton, Wastewater Microbiology, John Wiley & Sons, New York, 1996.
3. R.T. Haug, Compost Engineering, Lewis Publishers, Boca Raton, 1993.
4. B.C. Alleman, A. Leeson, Bioreactor and Ex Situ Biological Treatment Technologies, Battelle Press, Columbus-Richland, 1999.

### ***Course content***

Pollution of natural water and soil. Physical, chemical and biological indicators of pollution. Influence of untreated wastewater on natural recipients. Influence of biodegradable solid wastes on environment. Selection of processes for treatment of waste substances. Aerobic and anaerobic treatment processes. Examples: adsorption, biosorption and biodegradation of humic substances in natural waters. Biological denitrification of wastewaters and composting of agro-industrial solid wastes. Experimental determination of biochemical rate of reaction. Isothermal and adiabatic batch and flow reactors. Growth kinetics of microorganisms, growth kinetics of multiple microbial population, biological reactors design and analysis, optimisation and control of processes.

<b>Course</b>	<b>INDUSTRIAL ENERGY</b>
<b>Lecturer</b>	<b>PhD. Rajka Budin, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. J.de Beer, Potential for Industrial Energy-Efficiency Improvement in the Long Term, Kluwer Publ., Dordrecht, 2000.
2. G.Boyle (Ed.) Renewable Energy, Power for Sustainable Future, Oxford Un. Press, Oxford, 1996.
3. C.M.Gottschalk, Industrial Energy Conservation, John Wiley & Sons, West Sussex, 1996.
4. 4.F.Kreith,R.E.West (Ed.), Energy Efficiency, CRC Press, London, 1997.
5. Energy technologies for the 21th century, International Energy Agency, OECD, Paris, 1997.

### ***Course content***

Energy flows: requirements, consumption, resources, quality, quantity, availability, economy, environmental impact. Auditing and accounting: energy consumption projected and current performances, efficiencies, energy measures, principles of sustainability. Energy management: process flow scheme, kind and places of energy consumption, losses, energy conservation. Energy technologies: evaluation of existing, new technologies development. Heat recovery in regard to energy, economy and ecology. Possibilities for optimization: alternative resources, renewable and nonrenewable, availability and economy, cogeneration in industry, impact of improvements and environment pollution. Energy charts: integral systems and plants analysis, energy supply, heat recovery network. Industrial energy supply, heat recovery network. Industrial processes: polymerization, paper, inorganic, organic chemicals production; compression, ventilation, drying, evaporation. Results of optimization.

<b>Course</b>	<b>SYNTHESIS AND DESIGN OF PROCESSES</b>
<b>Lecturer</b>	<b>PhD. Ljubica Matijašević, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	seminar work, oral exam

### ***Literature necessary for course***

1. B. Linnhoff et al: Users guide on Process Integration for the Efficient Use of Energy, IChemE, London, 1994
2. T. M. Duncan, J.A. Reimer, Chemical Engineering Design and Analysis, Cambridge University press, 1998
3. L.T. Biegler, I.E.Grossman, J.J. Siirola, A.W. Westerberg, Systematic Methods of Chemical Process Design, Prentice Hall, 1997
4. E.Beer, Priručnik za dimenzioniranje uređaja kemijske procesne industrije, SKTH/KUI, Zagreb, 1994

### ***Course content***

Preliminary analysis and evaluation of processes. Basic of process synthesis. Batch versus continuous processes. Flowsheet and unit operations. Mass and energy balance – choice of system boundary. Input, output and recycle structure. The process integration for the efficient use of energy – methodology of pinch. Process synthesis – reactors and unit operations, simulation of processes. Optimization approaches to process synthesis and design. Unit operations and flowsheet analysis for pollution prevention, heat and mass exchange network synthesis, environmental cost accounting. Network synthesis of exchangers, distillation sequences. Modification of process with goals for minimisation of emissions into water, air and land. Case studies.

<b>Course</b>	<b>MONOLITHIC AND MEMBRANE REACTORS</b>
<b>Lecturer</b>	<b>PhD. Vesna Tomašić, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam and seminar work

### ***Literature necessary for course***

1. A. Cybulski and J.A. Moulijn, Structured Catalysts and Reactors, Marcel Dekker, N.Y., 1998.
2. G. Ertl, H. Knözinger and J. Weitkamp, Handbook of Heterogeneous Catalysis, Vol. 4, Wiley-VCH, Weinheim, 1997.
3. H. Brauer, Y.B.G. Varma, Air Pollution Control Equipment, Springer Verlag, Berlin, 1981.
4. R.A. Santen, P.W.N.M. van Leeuwen, J.A. Moulijn and B.A. Averil, Catalysis-An Integrated Approach, 2nd Ed., Studies in Surface Science and Catalysis, Vol. 123, Elsevier, Amsterdam, 1998.

### ***Course content***

Integrated approach to design of catalysts and reactors. Monolith structures, materials and properties. Comparison with conventional catalytic reactors. Monolithic reactors: Types of monolithic reactors; Preparation and characterization; Application for mobile sources (automotive exhaust gas treatment); Application for stationary sources (selective reduction of NO<sub>x</sub>, destruction of volatile organic compounds, catalytic combustion for gas turbine applications); Emerging applications (hydrogen generation for the fuel cell, steam reforming of hydrocarbons, fast catalyst screening and kinetic studies, other applications); Hydrodynamics, heat and mass transfer, kinetics and pressure drop; Modeling of monolith reactors Modeling of monolith reactors in three-phase processes; Scale-up aspects. Membrane reactors (monolithic reactors with permeable walls): The advantages of catalyst-membrane system; Permeability, permselectivity and stability of membranes; Membrane structure and shape; Membrane preparation; Flow patterns; Mechanisms of selective transport through inorganic membranes; Types of membrane reactors.

<b>Course</b>	<b>CATALYSTS DEACTIVATION</b>
<b>Lecturer</b>	<b>PhD. Stanka Zrnčević, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. Catalysis: An Integrated Approach, Eds. R.A. van Santen, P.W.N.M. van Leeuwen, J.A. Moulijn, B.A. Averil, Elsevier, Amsterdam, 2000.
2. Handbook of Heterogeneous Catalysis, Eds. G. Ertl, H. Knözinger, J. Weitkamp, VCH, Weinheim, 1997.
3. R. Hughes, Deactivation of Catalysts, Academic Press, London, 1995.

### ***Course content***

General aspects of catalyst deactivation. Classification of catalyst deactivation processes: poisoning, fouling, sintering, phase transformation. Selectivity and deactivation. Diffusion and deactivation. Catalyst design for deactivation resistance. Deactivation in catalytic reactor. Isothermal and non-isothermal analysis. Optimization of deactivating reactor systems.

<b>Course</b>	<b>POLYMERIZATION ENGINEERING</b>
<b>Lecturer</b>	<b>PhD. Marko Rogošić, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars, consultations,
<b>Knowledge verification</b>	seminar work, oral exam

### ***Literature necessary for course***

1. K.H. Reichert, W.Geiseler (Eds.), Polymer Reaction Engineering, Influence of Reaction Engineering on Polymer Properties, VCH, Munich, 1989.
2. K.H. Reichert, Polymerisationstechnik, Technische Universität Berlin, 2000.
3. J.A. Biesenberger, D.H.Sebastian, Principles of Polymerization Engineering, Wiley, New York, 1983.
4. Z. Janović, Polimerizacije i polimeri, HDKI, Kemija u industriji, Zagreb, 1997.
5. G. Odian, Principles of Polymerization, Wiley, New York, 1981.

### ***Course content***

Polymer molecular structure: basic ideas and definitions, nonuniformity, molecular weight distributions, molecular weight averages, chemical composition distributions of copolymers, average chemical composition.

Kinetics of chain and step homo and copolymerizations, influence of kinetic parameters on polymer product properties.

Polymerization thermodynamics.

Polymerization reactions in industry, homogeneous and heterogeneous polymerizations, bulk, solution, suspension and emulsion polymerizations, polymerizations on phase boundaries.

Polymerization reactors, modeling on macro, mezo and micro scale

Modeling and optimization of polymerization process according to the predefined product properties.

<b>Course</b>	<b>KINETIC MODELS</b>
<b>Lecturer</b>	<b>PhD. Zoran Gomzi, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral, final exam

### ***Literature necessary for course***

1. Yogesh Jaluria, Computer methods for engineering, Allyn and Bacon,inc., Boston, 1988.
2. M. E. Davis, "Numerical Methods and Modeling for Chemical Engineers", J. Wiley, New York, 1984. MICHAEL B. CUTLIP, M. SHACHAM, "Problem solving in Chemical Engineering with Numerical Methods"; Prentice Hall, Englewood Cliffs, New Jersey, 1999.
3. C. D. Holland and A. I. Liapis, "Computer Methods for Solving Dynamic Separation Problems", McGraw - Hill, New York 1983.
4. W. F. Ramirez, "Computational Methods for Process Simulation", Butterworths, London 1989.

### ***Course content***

Analysis of kinetic rate equations coupled with mass and energy balances to the choice and design of chemical reactors involving homogeneous and heterogeneous reactions. Details of complex kinetics. Methods of kinetic analysis and treatment of the experimental data. Parameter identification and state estimation techniques. Method of diagnostic parameters. Method of the similarity. Application of modified differential analysis (ID algorithm). Development of models of various physical and chemical processes. Multivalued responses. Error analysis. Topics include application of special experimental reactors, development of mathematical methods and algorithms used in kinetic analysis (Nelder – Mead, Levenberg), parameter estimation in complex systems.

<b>Course</b>	<b>MECHANICAL ASPECTS OF PROCESS EQUIPMENT</b>
<b>Lecturer</b>	<b>PhD. Veljko Filipan, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. V. Hubka: Principles of Engineering Design, Heurista, Zürich, 1987.
2. K. Lange: Handbuch der Umformtechnik, Springer Verlag, München, 1990.
3. N. E. Dowing: Mechanical Behaviour of Materials, Prentice Hall, New Jersey, 1993.
4. I. Alfirević: Linearna analiza konstrukcija, Fakultet strojarstva i brodogradnje (FSB), Zagreb, 1999.
5. T. Filetin, F. Kovačiček, J. Indof: Svojstva i primjena materijala, FSB, Zagreb, 2002.

### ***Course content***

Structure elements of process equipment: common components for various types of equipment, possibilities of modular approach in designing and manufacture, elements standardization, technical regulations and safety requirements, standards. Analysis of loadings, strains and stresses applied to process equipment components: the influence of manufacture and assembling process (initial and installation stresses, residual stresses), environment impacts (thermal stresses), influence of shaping (suitable cross sections, stresses distribution and concentration), dimensioning, operational strength and lifetime, estimation of safety and remaining lifetime, consideration on causes of fracture and surface damages. Generation procedure: process design, construction, the analysis of variant solutions, choosing of material and manufacture process, optimisation. Evaluation requirements and criteria: functionality, applicability, replace ability, assembly, type and mode of loading, manufacture process, transport possibility, convenient serving, maintenance, energy efficiency, environmental protection.

<b>Course</b>	<b>ADVANCE COURSE IN BIOREACTION ENGINEERING</b>
<b>Lecturer</b>	<b>PhD. Bruno Zelić, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. J. H. Nielsen, J. Villadsen, G. Liden, R. Roy: Bioreaction Engineering Principles, Plenum Pub. Corp., 2002.
2. K. Schugerl, K. H. Bellgardt: Bioreaction Engineering: Modeling and Control, Springer Verlag, 2000.
3. G. Stephanopoulos, A. Aristidou, J. Nielsen: Metabolic Engineering: Principles and Methodologies, Academic Press, 1998.
4. J. Bailey, D. Ollis, J. Bailey: Biochemical Engineering Fundamentals, McGraw Hill, 1986.

### ***Course content***

Introduction in basic concepts: biochemical engineering, bioreaction engineering, bioprocess engineering, metabolic engineering, genetic engineering. Unstructured kinetic models of growth, substrate uptake and product formation. Metabolic flux analysis. ATP balances. Structured kinetic models of growth, substrate uptake and product formation. Estimation of kinetic model parameters. Optimization of biotransformations – genetic algorithm and EVOP. Development, optimization and modeling of biotransformation processes with fully integrated separation of products.

<b>Course</b>	<b>ENVIRONMENTAL ENGINEERING AND MANAGEMENT</b>
<b>Lecturer</b>	<b>PhD. Natalija Koprivanac, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, consultation, case study
<b>Knowledge verification</b>	Writing exam, oral, seminar

### ***Literature necessary for course***

1. Liu, D.H.F., Liptak, B.G., Bouis, P.A.: Environmental Engineers' Handbook, Lewis Publishers, New York, 1996.
2. Allen, D.T., Rosselot, K.S.: Pollution Prevention for Chemical Processes, John Wiley, New York, 1997.
3. Sheldon, C.: ISO 14000 and Beyond, Environmental management Systems in the real World, Greenleaf Publishing, UK, 1997.
4. Corbitt, R.A.: Standard Handbook of Environmental Engineering, McGraw-Hill, New York, 1999.
5. Wickramanayake, G.B., Gavaskar, A.R.: Physical and Thermal Technology, Battelle Press, Columbus, Ohio, 2000.

### ***Course content***

Orientation for the sustainable development and concept. Basics principles of Environmental Management Systems (EMS) as tools to integral approach of environmental prevention and protection. Implementation of international standards: EMS ISO 14001, ISO 14040- Life Cycle Assessment, EMAS and so on. Cleaner production methodology and eco-efficiency. Techniques for impacts assessment and prediction. Responsible Care principles. Pollution prevention methodology. Reduction and removal of pollutants from air, water and soil. Unit treatment processes in water and wastewater engineering. Disposal of liquid waste. Advanced Oxidation Processes (AOPs) for wastewater pollution's minimization and mineralization. Industrial sewer design and implementation of common drainage systems. Solid waste reduction, separation and recycling. Solid waste-to-energy incinerators. Hazardous waste destruction technologies and disposal. The role of eco-engineers in implementation of corporate systems of environmental management.

<b>Course</b>	<b>CEMENT MATERIALS</b>
<b>Lecturer</b>	<b>PhD. Tomislav Matusinović, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. V.S.Ramachandran, Concrete Admixtures Handbook, Properties, Science and Technology, Noyes Publications, Park Ridge, New Jersey, 1984.
2. M.R.Rixon and N.M.Mailvaganam, Chemical Admixtures for Concrete, E. & F.N. Spon, London, New York, 1986.
3. P.Kumar Mehta, Concrete Structure, Properties and Materials, Prentice Hall, INC., Englewood Cliffs, New Jersey, 1986.
4. P.F.G. Banfill, Rheology of Fresh Cement and Concrete, E.H.F.N.Spon, Cambridge, 1991.

### ***Course content***

Rheologic behaviour of cement materials suspensions. Thixotropic behaviour. Anti-thixotropic behaviour. Influence of the process characteristics on rheological properties of the cement materials. Mechanisms and kinetics of hydration process. Models based on the reaction mechanisms. Processes with addition of chemically active substances. Crystal structures. Crystal structures and reactivity. The kinetics of hardening process. The kinetic model of hardening for rapid setting and hardening cement materials. Specific characteristics of cement materials. Structure and properties. The relation between porosity and strength. Model of compressive strength and porosity relationship for rapid setting and hardening cement materials. Design of the cement materials with objective properties.

<b>Course</b>	<b>DEGRADATION AND RECYCLING OF PLASTIC WASTE</b>
<b>Lecturer</b>	<b>PhD. Zlata Hrnjak-Murđić, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	Writing exam, oral exam

### ***Literature necessary for course***

1. J.Scheirs, Polymer Recycling: Science, Technology and Applications, J.Wiley & Sons, Brisbane, 1998.
2. J. F. Rabek, Fotostabilization of Polymers, Elsvire, London, 1990.
3. N.L.Nemerow, Waste Treatment, u H.F.Mark, N.M.Bikales, C.G.Overberger i G.Menges, Encyclopedia of Polymer Science and Engineering, J.Wiley & Sons, N. Y. 1989, Vol. 17, str. 699.
4. H.Alter, Disposal and Reuse of Plastics, u H.F.Mark, N.M.Bikales, C.G.Overberger i G.Menges, Encyclopedia of Polymer Science and Engineering, J.Wiley & Sons, N. Y. 1986, Vol. 5, str. 103.

### ***Course content***

Overview of sources of plastic waste: during processing and post-used. Pollution of environment during processing polymers; a) emission of gases b) water vapour condensation c) separation and treatment of solvents in use d) plastic waste in process. Sorting and separation techniques. Plastic waste management: a) source reduction b) in-process recycling c) waste treatment d) recycling and reuse and f) landfills. Recycling technique of plastic waste can be primary, secondary, and tertiary. Feedstock recycling-pyrolysis, hydrogenation, gasification, and chemical recycling as well. Incineration of plastic waste with energy recover. Economics of plastic waste management. Legislative and standards requirements concerning environment pollution.

<b>Course</b>	<b>DYES AND ENVIRONMENTAL PROTECTION</b>
<b>Lecturer</b>	<b>PhD. Sanja Papić, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	oral exam, seminar report

### ***Literature necessary for course***

1. Klaus Hunger, Industrial Dyes, Wiley-VCH, New York, 2002.
2. Heinrich Zollinger, Color Chemistry, VCH, New York, 1987.
3. Heinrich Zollinger, Color-A Multidisciplinary Approach, Wiley-VCH, New York, 1999.
4. Abraham Reife, Harold S. Freeman, Environmental Chemistry of Dyes and Pigments, John Wiley&Sons, New York, 1996.
5. Mackenzie L. Davis, David A. Cornwell, Introduction to Environmental Engineering, McGraw-Hill, New York, 1998.

### ***Course content***

Classification systems for dyes, chemical and usage classification. Correlations between the chemical structures of dyes and their applications. The basic steps of dye manufacture and equipment. Production processes of important dye classes. Eco-friendly processing. Industry's responsible management of synthetic organic dyes. Environmental impact assessment in different industries of dye application, textile, leather, paper and many others. Products safety information. Special regulations for dyes. Treatment methods for wastewater containing dyes and dye intermediates such as coagulation/flocculation, adsorption and different types of advanced oxidation processes.

<b>Course</b>	<b>POLYMER PROCESSING AND STRUCTURE/PROPERTY INTERRELATION</b>
<b>Lecturer</b>	<b>PhD. Vesna Rek, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	oral exam, seminars

### *Literature necessary for course*

1. R.G. Grisky, Polymer Process Engineering, Champan & Hall, New York, 1995.
2. A. A. Codlyer and L. A. Utracki, Polymer Rheology and Processing, Chapman &Hall, Hampshire, 1990.
3. T. A. Osswald and G. Mengs, Materials Science of Polymers for Engineers, Carl Hanser Verlag, Munchen, 1995.
4. J. C. Seferis, P. S. Theocaris, Interrelations between Processing, Structure and Properties of Polymeric Materials, New York, 1984.
5. V. Eisele, Introduction to Polymer Physics, Spring Verlag, New York, 1990.

### *Course content*

The survey of polymer materials. Thermosets, Thermoplastic and Elastomers. Thermoplastic rubber. The survey of polymer processing. The technologies of polymer material preparation. Additives. The effects on the polymer properties in processing and use. Elastic, plastic and viscous deformations and their importance in polymer processing and product properties. Processes parameters; the shear rate, shear stress, temperature and pressure. The processing machines and equipments variables. The material variables; thermal and rheological properties of fluids. The influence of processing and materials variables on rheological behaviour, heat transition, structure development in polymer processing and products properties. Orientation in polymer processing, memory effect, orientation distribution function in the moulding section and melt fracture. Reaction moulding, RIM, RRIM technology. The kinetic of crosslinking. The structure modification by annealing and irradiation. Stability in polymer processing. The remain stresses. Physical ageing. Recycling.

<b>Course</b>	<b>THE STABILITY OF POLYMERIC MATERIAL</b>
<b>Lecturer</b>	<b>PhD. EMI GOVORČIN-BAJSIĆ, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	Writing exam, oral exam

### ***Literature necessary for course***

1. S. H. Hamid, Polymer Degradation, Handbook, M. Dekker, New York, 1998.
2. H. L. Williams, Polymer Engineering, Elsevier, New York 1985.
3. C. Hall, Polymer Materials, John Wiley, New York, 1990.
4. L. C. E. Struik, Physical Ageing in Amorphous Polymers and Other Materials, Elsevier, Sci. Publ. Co., Amsterdam, 1978.
5. Collyer, L. A. Utracki, Polymer Rheology and Processing, Elsevier, Sc..Publ.Co., INC., New York 1990.

### ***Course content***

Polymer materials. Properties of polymer materials as a major class of engineering materials and their compositions. Stability under the influence of external and internal factors. Material valuation. Degradation agencies, ageing. . Physical ageing. The stresses remain. Stability on stresses. Material failure. Flame resistance. The degradation processes in polymer artefacts production. Kinetic and kinetic modeles. Parameters modeles evaluation. Degradation in polymer production and processing. Processing parameters, the processing equipments variables and the processing conditions and their influence on the polymer stability. The influence of processing parameters the processing equipments variables and processing conditions on the stability of polymer, polymer material and polymeric products. The stability in flow processes and deformation. Fluids and solids processing. The engineering properties changes during degradation and physical ageing; mechanical, thermal and rheological properties. Multiphase materials and stability. Additives and reinforcements. Stability of reinforced and cellular plastics. Tailoring the polymer stability by polymer compositions, conduction and control of processes in polymer production and processing. Initiated degradation and its conduction. Reactive modification. Recycling of plastics; material chemical and energetic. Programmed degradation. Protection of polymeric materials. Stabilizers, additives and flame retardants. Evaluation of life cycles.

<b>Course</b>	<b>ADVANCED PETROLEUM REFINERY PROCESSES</b>
<b>Lecturer</b>	<b>PhD. Katica Sertić-Bionda, associate professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam, seminar

### ***Literature necessary for course***

1. J.G.Speight, The Chemistry and Technology of Petroleum, 2<sup>nd</sup> Ed., M. Dekker Inc., N.Y. 1991.
2. R.A.Meyers, Handbook of Petroleum Refining Processes, McGraw-Hill, N.Y., 1986.
3. G.D.Hobson, Modern Petroleum Technology, 5<sup>th</sup> Ed., J.Wiley, N.Y., 1984.
4. J.C.Guibet, E.Faure Birchem, Fuels and Engines, Vol. 1., Editions TECHNIP, Paris, 1999.

### ***Course content***

Strategy and developments of new refinery processes: the influence of hydrocarbon and nonhydrocarbon contents in petroleum fuels on their applied properties and ecological characteristics. Additives for fuels and lubricants characteristics improvement. Catalytic reforming: process engineering aspects; reaction mechanisms, thermodynamic conditions, catalyst properties, kinetic and reactor models. The ecological process aspects: decreasing of benzene content in catalytic reforming feed and products in relation to C<sub>5</sub>-C<sub>6</sub> isomerization and aromatics production. The processing of higher petroleum fractions: catalytic cracking, hydrocracking, hydrodesulfurization; engineering aspects of new technological designs, decreasing of sulphur content. Alkylation and oligomerization processes and production of motor gasoline additives, reactions, catalysts and processing units design.

<b>Course</b>	<b>MODIFICATION OF POLYMER MATERIALS</b>
<b>Lecturer</b>	<b>PhD. Jasenka Jelenčić, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam, seminar

### ***Literature necessary for course***

1. H.F. Mark, N.M. Bikales, C.G. Overberger, G. Menges: Encyclopedia of Polymer Science and Engineering, John Wiley, Vol. 1-17, 1986-1989.
2. C. Hall: Polymer Materials, John Wiley, New York, 1991.
3. C.M. Chan: Polymer Surface Modification and Characterization, Hanser Publishers, Munchen, 1993.
4. W. Schnabel: Polymer Degradation, Hanser Publishers, New York, 1981.

### ***Course content***

Macromolecular reaction reactions: side-group reactions, cyclization, crosslinking and vulcanization, grafting of polymers. Purpose of modification: changes of physical form and solubility, decreasing and increasing of combustibility and mechanical properties. Modifications of polymer materials with chemical reactions and physical methods-regeneration, esterification, etherification, hydrolysis, bromination, chlorination, graft copolymerization. Modification by inorganic fillers. Interactions of modifier/ additives/ fillers. Use of mathematical models of mechanical properties in composition systems and experimental results and parameters.

<b>Course</b>	<b>ENGINEERING OF BOUNDARY LAYERS</b>
<b>Lecturer</b>	<b>PhD. Vera Kovačević, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. R.J. Stokes, D.F. Evans, Fundamentals of Interfacial Engineering, Wiley-VCH, 1997. Fundamentals of Adhesion and Interfaces, Eds. D.S. Rimi, L.P. DeMejo, K.L. Mittal, VSP, Utrecht, 1995.
2. G.J. Fleer, M.A. CohenStuart, J.M.H.M. Scheutjens, T. Cosgrove, B. Vincent, Polymers at Interfaces, Chapman & Hall, London, 1993.
3. W.J. Feast, H.S. Munro, Polymer Surfaces and Interfaces, John Wiley & Sons, Chichester, 1987.
4. Polymer Surface Modification: Relevance to Adhesion, Vol. 1,2, Ed. K.L. Mittal, VSP, Utrecht, 1996, 2000.

### ***Course content***

Specialist knowledge needs by following, controlling modification and development of new processes at surfaces. Processes at boundary layers. Characteristics and nature of practical surfaces. Defining the interfacial area. Interphase solid/liquid/vapour. Thermodynamic and kinetic consideration of processes in the interfacial area. Interphase polymer layers. Density and morphology of adsorbed polymer layers. Modification of polymer surfaces. Aging effects at the surface pre-treated polymers. Chemical, morphological and electrical modifications. Effects of modification on the adhesion polymer/polymer and polymer/metal. Combining the techniques of surface characterisation. Tribology. Mechanisms of friction and wear. Friction and adhesion of polymer materials. Surface topography and adhesion.

<b>Course</b>	<b>ADHESIVE PROCESSES AND MATERIALS</b>
<b>Lecturer</b>	<b>PhD. Mirela Leskovac, assistant professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, seminars
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. Contact Angle, Wettability and Adhesion, Ed. K.L. Mittal, VSP, Utrecht, 1993.
2. A.J. Kinloch, Adhesion and Adhesives, Chapman & Hill, London, 1995.
3. E.M. Petrie, Handbook of Adhesives and Sealants, MacGraw-Hill, New York, 2000.
4. Handbook of Adhesives, Ed. D.E. Packham, Longman Scientific & Technical, Harlow, 1992.
5. R. Rother, Particulate-filled Polymer Composites, Longman Scientific & Technical, Harlow, 1995.

### ***Course content***

Surface and adhesion phenomena. Surface free energy and critical surface tension. Interface and interphase adhesion/substrate. Interfacial contacts. Molecular contacts and kinetics of interdiffusion. Kinetics of wetting and balanced wetting. Theory of contact angles. Thermodynamics of adhesion. Surface-chemical criteria for optimal adhesion. Interphase optimisation. Theories and mechanisms of adhesion. Techniques of investigations the nature of interphase. Adhesive materials and properties. The role of polymer component and modifications in adhesive compositions. Aging and degradation of components in adhesive. Morphology of two-phase and multi-phase systems and failure. Physical nature of adhesive materials. Ecological demands in application. Stability of adhesive joints under the environmental influence.

<b>Course</b>	<b>METAL CORROSION INHIBITORS</b>
<b>Lecturer</b>	<b>PhD. Ema Stupnišek-Lisac, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. Y. I. Kuznetsov, Organic Inhibitors of Metals, Plenum Press, New York, 1996.
2. V. S. Sastri, Corrosion Inhibitors, J. Willey & Sons, Inc., New York, 1998.
3. E. Kalman, Routes to the Developmens of Low Toxicity Corrosion Inhibitors in Corrosion Inhibitors ed. The Institute of Materials, London, 1994.
4. C. Leygraf: Corrosion Mechanisms in Theory and Practice, Marcel Dekker, Inc. New York, 1995.
5. Uhlig's Corrosion Handbook, ed. R. Winston Revie, J. Willey & Sons, Inc. New York, 2000.

### ***Course content***

Mechanism and kinetic of corrosion processes. Methods of corrosion protection of metals. Mechanism of corrosion inhibitors activity. Adsorption processes. The influence of the structure and composition of organic compounds to the inhibiting properties. The new corrosion inhibitors design. The choice of the inhibitors depending on materials, media and other conditions of application.

The methods of inhibitor efficiency determination at atmospheric corrosion and at corrosion in the solution using electrochemical and non-electrochemical techniques. Protecting degree of inhibitors. The protecting efficiency of inhibitors in flow conduction. Inhibitors for temporary protection. Vapour phase inhibitors (VPI). "Dangerous" and "safe" inhibitors. Methods for evaluation and control of the metal corrosion inhibitor efficiency. The use of inhibitors in electronic device industry, petrochemical and processing industry.

Economical and environmental suitability of metal corrosion inhibitors. Evaluation of the inhibitor toxicity. Analysing of the possibilities of replacing toxic corrosion inhibitors with new environmental friendly

<b>Course</b>	<b>APPLIED TRANSPORT PHENOMENA</b>
<b>Lecturer</b>	<b>PhD. Tine Koloini, full professor</b>
<b>Institution</b>	Faculty of Chem. and Chem. Technology, Ljubljana, Slovenia
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for course***

1. T. K. Sherwood, R.L. Pigford, C.R. Wilke, Mass Transfer, McGraw Hill, New York, 1975.
2. J. R. Welty, C.E. Wicks, R.E. Wilson, Fundamentals of Momentum, Heat and Mass Transfer, 2nd Ed., John Wiley, New York, 1976.
3. M. Zlokarnik, H. Judat, Mixing, Bayer, Leverkusen, 1987.
4. R. H. Perry, Chemical Engineers' Handbook, 6th Ed., McGraw Hill, New York, 1985.
5. R. D. Noble, S.A. Sern (Eds.), Membrane Separations, Technology, Principles and Applications, Elsevier, Amsterdam, 1995.
6. F. P. Incropera, D.P. Dewitt, Fundamentals of Heat and Mass Transfer, 4th Ed., John Wiley, New York, 1996.
7. E. L. Cussler, Diffusion-Mass Transfer in Fluids, 2nd Ed., Cambridge University Press, Cambridge, 1997.

### ***Course content***

Interphase mass transfer. Important correlations. Simultaneous heat and mass transfer. Absorption in reactive media. Film and penetration theories for the first order reactions. Adsorption ion exchange. Equilibrium data. Break through curves. Column dynamics. Design of the ion exchange and adsorption processes. Heat and mass transfer in the stirred tank and bubble column reactors. Correlating equations for gas liquid mass transferring Newtonian and non-Newtonian systems. Membrane separation processes. Microfiltration. Ultrafiltration. Reverse osmosis Dialysis. Membrane modules. Membrane filtration and diffusion processes. Polarization phenomena. Applications in biotechnology and in environmental

<b>Course</b>	<b>HIGH-PRESSURE PROCESS TECHNOLOGIES</b>
<b>Lecturer</b>	<b>PhD. Željko Knez, full professor</b>
<b>Institution</b>	Fakultet za kemijo in kemijsko tehnologijo, Univerze v Maribor
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	oral exam, seminar

### ***Literature necessary for course***

1. Bertucco, G. Vetter, High Pressure Process Technology: Fundamentals and Applications, Elsevier, ol. 9, 2001.
2. G. Brunner, Gas Extraction; An Introduction to Fundamentals of Supercritical Fluids and the Application to Separation Processes, Springer New York, Vol. 1-4, 1994.
3. V. Bright, M. E. P. McNally, Supercritical Fluid Technology, ACS Symposium Series 488, ACS. Washington, DC, 1992.
4. M. McHugh, V. Krukonis, Supercritical Fluid Extraction, Butherwords Inc., 1986.
5. M. B. King, T. R. Bott, Extraction of Natural Products using near-critical Solvents, Blackie Academic & Professional Chapman & Hall, 1993.

### ***Course content***

Thermodynamic properties at high pressure, kinetic properties at high pressure, design and construction of high pressure equipment for research and production, industrial reaction units, separation operations and equipment, safety and control in high pressure plant design and operation, economics of high pressure processes, applications of: chemical reactions in Supercritical Solvents (SCFs), enzymatic reactions and hydrogenation under supercritical single-phase conditions, Supercritical Water Oxidation (SCWO) and their application to industrial wastewater treatment, high pressure polymerisation with metallocene catalysts, supercritical fluid extraction and fractionation from solid materials, high pressure polymer processing, precipitation of solids with dense gases, pharmaceutical processing with supercritical fluids, treating microorganisms with high pressure, dry cleaning with liquid carbon dioxide.

<b>Course</b>	<b>DYNAMIC MODELLING OF DEEP BED FILTRATION</b>
<b>Lecturer</b>	<b>PhD. Antun Glasnović, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures
<b>Knowledge verification</b>	Writing exam, oral exam

### ***Literature necessary for course***

1. C. Tien, Granular Filtration of Aerosols and Hydrosols, Butterworths Series in Chemical Engineering, Butterworths Publishers, USA, 1989.
2. K. J. Ives, Deep Bed Filters: Solid/Liquid Separation Equipment Scale-Up, Uplands Press Ltd., Croydon, 1977.
3. R. I. Mackie, R. M. Horner, R. J. Jarvis, Dynamic Modelling of Deep Bed Filtration, AIChE J. , 33 (1987) 1761.
4. A. Glasnović, Deep Bed Filtration, Kem.Ind., 41(1992), 163.
5. S. Osmak, D. Gosak, A. Glasnović, Dynamic Mathematical Model of Deep bed Filtration Proces, Computers Chem. Eng., 21 (1997) S763.

### ***Course content***

General characteristics of deep bed filtration. Mechanisms of deep bed filtration. Macroscopic (Phenomenological) description of deep bed filtration; macroscopic equations, filter coefficient. Microscopic description of deep bed filtration (Trajectories theory). Model representation of unit filter bed elements; collector model, collection efficiency. Deep bed filtration with chemical pretreatment. Design of deep bed filtration. Simulation of the dynamic behaviour of deep bed filtration. Optimization of deep bed filtration.

<b>Course</b>	<b>PARTIAL DIFFERENTIAL EQUATION</b>
<b>Lecturer</b>	<b>PhD. Ivan Perić, associate professor</b>
<b>Institution</b>	Faculty of Food Technology and Biotechnology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, simulation on Wolfram's Mathematica
<b>Knowledge verification</b>	oral exam

### ***Literature necessary for the course***

1. J. C. Strikwerda, Finite Difference Schemes and PDE, Chapman & Hall, 1989.
2. G. A. Sod, Numerical Methods in Fluid Dynamics, Cambridge University Press, 1985.
3. P. DuChateau, D. Zachmann, Applied PDE, Harpper & Row Publishers, 1989.
4. B. M. Young, R. T. Gregory, A Survey of Numerical Mathematics, Addison-Wesley Publishing Company, Reading Massachusets, 1973.
5. Ž. Marković, Uvod u višu analizu II, Sveučilište u Zagrebu, Zagreb, 1968.

### ***Course content***

The aim of this course is to present the basic analytic and numeric methods for solving partial differential equations (PDE) with emphasis on parabolic PDE. Special attention is dedicated to qualitative analysis (convergency, consistency, stability) of finite difference schemes. Some topics are: classification of PDE, parabolic, hyperbolic elliptic PDE. Fourier analysis. Eigenfunctions. Laplace transform. Finite difference scheme. Convergency, consistency. Well-posed and stable initial-boundary value problems.

After introductory part, classifications of PDE, consideration of convection-diffusion equation with initial –boundary conditions, we develop some analytical methods for solving PDE also necessary for qualitative of numerical methods (Fuorier analysis). In the third part finite difference schemes are introduced, and finally we give qualitative analysis of given schemes for parabolic PDE. Some of the problems will be solved and simulated on Wolfram's Mathematica.

<b>Course</b>	<b>BIOCATALYSTS AND BIOTRANSFORMATIONS</b>
<b>Lecturer</b>	<b>PhD. Đurda Vasić-Rački, full professor</b>
<b>Institution</b>	Faculty of Chemical Engineering and Technology, Zagreb
<b>ECTS</b>	8
<b>Course type</b>	Optional
<b>Name of study</b>	Chemical engineering
<b>Study</b>	Doctoral study
<b>Term</b>	2nd term
<b>Lecture type</b>	Lectures, thesis oriented research
<b>Knowledge verification</b>	Oral exam

### ***Literature necessary for course***

1. J.M.S.Cabral, D.Best, L.Boross, J.Tramper, "Applied Biocatalysis", Harwood Academic Pub. , Chur, 1994.
2. A.Tanaka, T.Tosa, T.Kobayashi, "Industrial Application of Immobilized Biocatalysts", Marcel Dekker, New York, 1993.
3. "Industrial Biotransformations", Liese, Andreas, Seelbach, Karsten, Wandrey Christian (ed.). Weinheim : Wiley-VCH, 2000.

### ***Course content***

Homogeneous and heterogeneous biocatalysis concept. Biocatalysts and biotransformations. Strategy for continuous biotransformation process development. Optimisation of biotransformations processes. Case studies of industrial biotransformations. Development and optimisation of enzyme membrane reactor (synthesis of optical pure amino acids). Economical and environmental aspects of enzyme reaction engineering. (enzymatic resolution of amino acids). Optimisation of kinetic and thermodynamic continuous enzymatic synthesis of dipeptide. Mathematical modelling of enantioselective enzymatic reaction (continuous enantioselective synthesis of optical pure alcohol).

### **II. 3.5. Rhythm of studying and students' obligations**

Students sign up for three basic courses in 1<sup>st</sup> semester and three elective ones in 2<sup>nd</sup> semester. The total number of ECTS credits for subjects is 60. The elaboration of doctoral thesis is 120 ECTS credits, that means 180 ECTS credits total. Students must publish one scientific work in CC magazine before defending the doctoral thesis.

### **II. 3.6. System of leading through the study**

The study of Chemical Engineering has the leader of the study who directs the students into the choice of courses and monitors their work. The Faculty Council determines the mentor for each student on the suggestion of the leader of the postgraduate study. As a rule, the mentor is the lecturer at the Faculty, while the mentors outside the faculty must be approved by the Faculty Council for each particular case.

### **II. 3.7. List of subjects from other postgraduate studies**

Students of Chemical Engineering can sign up for courses from postgraduate doctoral study Engineering Chemistry and Ecoengineering as well as from specialized programs Ecoengineering and Corrosion and protection. Students can also choose the subjects from other postgraduate doctoral and specialist studies from the faculties of the University in Zagreb in the percent of 20%, that is 12 ECTS credits.

### **II. 3.8. List of subjects that can be taught in foreign language**

All the mentioned subjects can be taught in English.

### **II.3.9. Criteria and conditions for transfer of ECTS credits**

If the student signs up for courses from other studies at the faculty or courses from studies from other faculties at the University of Zagreb, they have the same number of credits as the elective subjects that is 8 ECTS credits.

### **II.3.10. The way of finishing the study and conditions for recording the doctoral thesis theme**

During the study, no later than the end of 1<sup>st</sup> year of the doctoral study, the student is obliged to suggest the theme and explanation of his final work in accordance with the mentor. The theme with the explanation is accepted by the Faculty Council and it is confirmed by the Faculty Senate. During the doctoral study, the student is obliged to have one presentation of the doctoral theme. Before defending the doctoral theme the student must publish one scientific work from the field comprised in the doctoral theme. Doctoral theme which is not defended in the course of 6 years from the day of the theme acceptance is subjected to the renewed acceptance process. Doctoral theme is defended in front of the Commission consisting of three members (exceptionally five members) and one member as the substitute in the scientific- teaching profession and in the field and area connected with the doctoral theme. Student's mentor cannot be the president for evaluating and defending the theme. One member of the Commission for evaluating and defending the doctoral thesis must be out of the faculty. Defending of doctoral thesis is open to public and must be announced on the bulletin board of the faculty at least eight days before the presentation. The Commission composes and signs the record of theme defending.

### **II. 3.11. Conditions under which the students who interrupted their study or who lost right to study at one courses can continue their study**

The book of rules will solve all the conditions of transition and possibilities of continuation the study.

### **II. 3.12. Conditions under which the attendant gets the right on confirmation about becoming eligible for the part of the doctoral study as the part of the whole-life education**

### II. 3.14. Maximal length of studying from the beginning to the end

The studying length is three years, and the maximal studying length from the beginning up to the end is six years.

## II.4. Conditions of course performing

### II.4.1. Places for course program performing

Course programs are performed in lecture-room, laboratories and computer class-rooms of the Faculty.

### II.4.2. Data about the facilities and equipment foreseen for course performing

The Faculty has at its disposal:

a) lecture-rooms:

Big lecture-room at Marulićev trg (Marulić square) 20	120 places
Big lecture-room at Marulićev trg (Marulić square) 19	180 places
Small lecture-room at Marulićev trg (Marulić square) 20	70 places
Small lecture-room at Marulićev trg (Marulić square) 19	50 places
Big lecture-room in Savska cesta (Savska street) 16	80 places
Small lecture-room in Savska cesta (Savska street) 16	30 places
3 lecture-rooms of the Department each having	10 places

b) laboratories:

Marulićev trg 20

Students' laboratory	160 working places
Research laboratory	55 working places

Marulićev trg 19

Students' laboratory	62 working places
Research laboratory	19 working places

Vukotinovićeva cesta 2

Students' laboratory	10 working places
Research laboratory	6 working places

Savska cesta 16

Students' laboratory	78 working places
Research laboratory	21 working places

c) computer class-room Marulićev trg 20	8 working places
computer class-room Savska cesta 16	16 working places

Faculty has over 300 computers networked over servers Marie and Pierre and placed on Marulićev trg 20 and in Savska cesta 16.

d) offices of Faculty teachers and cooperators are on Marulićev trg 20, Marulićev trg 19, Savska cesta 16, Ilica 36, Ilica 53 and Vukotinovićeva 2.

e) library information center (LIC)

Library with its book totals covers the area of Chemical Engineering, Chemistry, Physics, Mathematics and Science of Environment.

Periodicals (about 330 titles, 75 of which are in LIC) while monographs (about 22000) from the specialized areas of computer sciences are processed in placed in the corresponding Departments at the Faculty.

## INSTRUMENTS

Potentiostat/galvanostat, Solartron SI 1287  
Frequency analyzer, Solartron SI 1260  
Electrochemical crystal nanoquartz balance  
Potentiostat/galvanostat, Elchema PS-205B  
Potentiostat/galvanostat, Ametek 273A  
Potentiostat/galvanostat, Ametek 263A  
Frequency analyzer, Ametek FRD 1025  
Optical microscope Olympus SZH10  
Potentiostat/galvanostat, EG&G PAR model 273  
Frequency analyzer, EG&G PAR model 5301 "lock-in" amplifier  
Bipotentiostat/galvanostat, Elektrolab BPG-200  
Rotating ring-disc electrode, Tachyprocesseur Radiometer Analytical  
Differential Scanning Calorimeter  
Dynamic Mechanical Analyzer  
Rotational Viscosimeter  
Equipment for accelerate ageing; High pressure Quartz mercury vapour lamp  
FTIR spectrophotometer Perkin Elmer Spectrum One  
UV chamber SUN-TEST CPS HEREUS 7281785 6259  
Thermostatic chamber Memmert  
Ozone generator MIC System Inc  
Liquid chromatography Shimadzu  
Spectral photometer SPEKOL 210 MA-9525 4581  
Organic halide analyzer Dohrman  
Apparatus TOC -total organic carbon analyzer  
UV/VIS spectrophotometer  
Photoreactor  
Apparatus for ASTM distillation  
Apparatus for determination of aniline point  
Apparatus for determination of inflammation point  
Abbe refractometer  
Apparatus for determination of mechanical properties of materials  
Apparatus for determination of impact strength  
Apparatus for preparation of test specimens for mechanical studies  
Apparatus for reverse osmosis and membrane testing (self-made)  
Carbon Analyser  
Contact Angle Measuring System, OCA 20, DataPhysics  
Universal Testing Machine  
Spectrophotometer, UV-1601, Shimadzu  
Bioreactor, Biostat MD  
Electrophoresis system, E-100  
Electrodialysis system, Type 02  
HPLC, Sykam  
Gas Chromatograph, Siemens  
High Pressure Reactor (Parr)  
Gas Chromatograph (VARIAN 3300)  
pH-meter INOLAB-LEVEL  
Hydrogen generator (Packard)  
Pulse Chemisorb 2700 (Micromeritics)  
Ultraviolet spectrophotometer (Pye UNICAM)  
Ion Chromatograph, Dionex, model DX 600  
High Performance Liquid Chromatograph, Varian, ProStar,  
CAMAG TLC Scanner II

Atomic Absorbent Spectrometer, Perkin Elmer 37  
Flame photometer Model III, Carl Zeiss, Jena  
Spectrophotometer, Perkin Elmer 124  
Spectrophotometer, MA 9525-SPEKOL 210,  
Spectrophotometer, Perkin Elmer, Lambda 1,  
Digital pION metar, E940, Orion Research  
Digital pION metar, 801/A, Orion Research  
Microwave Accelerated Reaction System for Extraction and Digestion, Varian, MARS X,  
Ion coupled plasma – mass spectrometer  
Gas chromatograph - mass spectrometer  
UV-Vis spectrophotometer Varian DMS-80  
UV-Vis spectrophotometer Varian Cary 100  
Polarograph Potentiostat/Galvanostat PAR 263A  
Spectrophotometer HACH DR/2400  
SRI 8610C Gas Chromatograph,  
Buck scientific Inc  
Composting bioreactor with mechanical agitation and forced aeration  
Microscope OLYMPUS BX50  
Kjeltec 2100 Distillation Unit with 2006 Digestion System  
ASAP Micromeritics – instrument for specific surface and pore size distribution determination  
RHEOMETER BROOKFIELD DVIII+  
COULTER COUNTER ZM – instrument for particle size distribution determination  
Varian Cary 50 Scan UV-Visible Spektrophotometer  
UV Perkin Elmer Double Beam Spectrophotometer 124  
Varian CARY ECLIPSE Fluorescence Spectrophotometer  
IR-Perkin Elmer M-297 Spectrophotometer  
IR-Perkin Elmer M-137 Spectrophotometer  
GC-MS (Varian CP-3800 Gas Chromatograph-Varian Saturn 2200)  
Varian NMR EM360L Netzch, STA409 simultaneous thermal analyser (DSC/TGA)  
Netzch, DSC200 thermal analyser (DSC)  
Phillips, powder X-ray diffractometer  
Fritsch, Pulverisette 6, planetary mill

### II.4.3. List of scientific and technological projects for doctoral study

#### Scientific projects

Number	Senior Researcher	Project Title
0125001	Stanka Zrnčević	Environmental Catalysis
0125002	Tomislav Matusinović	Development of Hydration Process Model
0125009	Rajka Budin	Promoting Energy Efficiency in Industry Sector
0125013	Vera Kovačević	Particulate Filled Microcomposites, Nanocomposites and Polymer Blends
0125014	Sanja Martinez	Experimental Investigation and Calculus Models in Corrosion Protection Systems
0125018	Natalija Koprivanac	Advanced Oxidation Processes for Reduction Waste of Organic Chemical Industry
0125019	Helena Jasna Mencer	Novel Materials for Specific Purposes
0125021	Đurđa Vasić Rački	Biocatalysts and Biotransformations
0125059	Vesna Rek	Modification and Stability of Multiphases Polymeric Systems
0125060	Antun Glasnović	Process Properties of Dispersed Systems

### Technological projects

	<b>Coordinator</b>	<b>Project</b>
TP-01/0125-05	Natalija Koprivanac, PhD	AOP in Treatment of Industrial Waste Water
TP-01/0125-07	Alojz Caharija, PhD	Distributed Laboratory for Remote Leading of Processes and Education
TP-01/0125-09	Tomislav Matusinović, PhD	New Cement Materials
TP-01/0125-12	Ljubica Matijašević, PhD	New Reactor Line and Washing System of Waste Gases in NPK Fertilizer Plant
TP-01/0125-18	Nenad Bolf, MSc	Procedure of Thermographic Diagnostics for Process Equipment
TP-03/0125-24	Stanislav Kurajica, PhD	Transparent nanocrystalline glass-ceramic
TP-03/0125-25	Alojz Caharija, PhD	Equipment for testing hydrocarbons thermal composition
TP-03/0125-26	Jasenska Jelenčić, PhD	Washable leather

## II.4. List of lecturers

**Lecturer data**

**Surname, Name**                    **PhD. Marin Hraste, full professor**  
**E-mail adress**                    mhraste@fkit.hr  
**Course**                                **ENGINEERING OF PARTICULATE SYSTEM**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Born: Sisak, Croatia, September 24, 1938.

Education: B.A. at Faculty of Technology, University in Zagreb 1962, M.Sc. at Faculty of Pharmacy, University of Zagreb 1967 and Ph.D, at Faculty of Technology, University of Zagreb 1972. Trainee in Boots Pure Drug Co. Nottingham, England and Kali - Chemie A.G. Hannover, Germany.

Years within the firm: From 1963 on Faculty of Chemical Engineering and Technology, University of Zagreb teaching assistant, assistant professor, associate professor and from 1982 Professor of Chemical Engineering. From 1993 to 1997 Faculty Dean. Visiting scientist: National Research Council of Canada, Ottawa, Canada and University of Technology, Dresden, Germany.

Courses taught at University: Unit operation, Transport phenomena and Engineering of particulate systems. Research interest: Particle technology with emphasize on mechanical processes for transforming materials, such as size reduction, size enlargement, separation and contacting.

Membership: Croatian Academy of Engineering and associate fellow of Croatian Academy of Science and Art. Representative of Croatian Society of Chemical Engineers to European Federation of Chemical Engineering. Member of EFCE Section for Product Design and Engineering.

**Date of last election**

16.09.1997.

**Referent publications of lecturer**

1. K. Vidović, B. Lovreček and M. Hraste: Influence of surface charge on sedimentation and filtration behavior of fibrous material, Chem. Biochem. Eng. Q. 10, 33 (1996)
2. Z. Knežević, D. Gosak, M. Hraste and I. Jalšenjak: Fluid-bed microencapsulation of ascorbic acid, J. Microencapsulation, 15, 237 (1998)
3. Z. Špirić and M. Hraste: Mercury saturation profile across the sulfur impregnated activated carbon bed, Mercury contaminated sites: Characterization, risk assessment and remediation, R. Ebinghaus, R.R. Turner, D. Lacerda, O. Vasiliev and W. Salomons ( eds. ), Springer Environmetal Science, Springer Verlag Heidelberg 1999, 409 – 417
4. M. Hraste. Mehaničko procesno inženjerstvo/ Particle Technology, Hinus, Zagreb 2003-(In Croatian).

**List of papers in last 5 years**

1. Hraste: Trends in Chemical Engineering Education, Annu. Croat. Acad. Eng. ISSN 1332-3482, Zagreb 2004.
2. M. Hraste: O razvoju kemijskog inženjerstva, Tehnika u Hrvatskoj, Matica hrvatska ISBN 953-150-701-5, Zagreb 2004.
3. M. Hraste: Mehaničko procesno inženjerstvo, Hinus ISBN 953-6904-07-1, Zagreb, 2003.
4. Z.Špirić and M. Hraste: Mercury saturation profile across the sulfur impregnated activated carbon bed, Mercury contaminated sites: Characterization, risk assessment and remediation, R. Ebinghaus, R.R. Turner, D. Lacerda, O. Vasiliev and W. Salomons.

**Lecturer data**

**Surname, Name**                    **PhD. Zoran Gomzi, full professor**  
**E-mail adress**                    zgomzi@fkit.hr  
**Course**                                **CHEMICAL REACTOR ANALYSIS**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Born 25.3.1940. in Karlovac, Croatia. B.Sc. degree 1963, Ph.D. 1975, Faculty of chemical technology, University of Zagreb. Job record: three years in industry (battery factory), 1964 – 1967., assistant 1967 – 1975, assistant professor 1975 – 1983, associate professor 1983 – 1988, full professor 1988-, all at Faculty of Chemical Engineering and Technology, Zagreb. Research activities: Published more than fifty scientific papers, twenty four in Journals CC cited. Published fifteen professional papers. Principal investigator in three scientific projects and collaborator in four projects. Ten projects and other studies conducted for industry. Main research topics: Applied reaction kinetics, particular reactor types (monolithic, multiphase), modeling and numerical methods in chemical engineering.

**Date of last election**

12.01.1999.

**Referent publications of lecturer**

1. V. Tomašić, Z. Gomzi, S. Zrnčević, Kinetics of NO decomposition over Cu/ZSM-5 Catalyst, *React.Kinet.Catal.Lett.*, **64**, 1 (1998) 89-95.
2. V. Kosar, Z. Gomzi, Thermal Effects of Cure Reaction for an Unsaturate Polyester in Cylindrical Moulds, *Chem.Biochem.Eng.Q.*, **15** (3) (2001) 101-108.
3. V. Tomašić, Z. Gomzi, Development of the Structured Catalysts for the Exhaust Gas Treatmet, *Chem.Biochem.Eng.Q.* **15** (3) (2001) 109-115.
4. V. Tomašić, S. Zrnčević, Z. Gomzi, Modelling and Simulation of a Monolith Reactor, *Pol. J. of Env. Studies*, **11**, (3) (2002) 23-28.
5. F. Briski, N. Horgas, M. Vuković, Z. Gomzi, Aerobic composting of tobacco industry solid waste – simulation of the process", *Clean Techn. Environ. Policy*, **5** (2003) 295-301.

**List of papers in last 5 years**

1. V. Kosar, Z. Gomzi "Thermal Effects of Cure Reaction for an Unsaturated Polyester in Cylindrical Moulds", *Chem.Biochem.Eng.Q.*, **15** (3) 101-108 (2001).
2. V. Tomašić, Z. Gomzi, "Development of the Structured Catalysts for the Exhaust Gas Treatment", *Chem. Biochem. Eng. Q.*, **15** (3) 109-115 (2001).
3. V. Tomašić, Z. Gomzi, S. Zrnčević, Reaction and Mass Transfer Effects in a Catalytic Monolith Reactor", *React. Kinet. Catal. Lett.*, **77**, 2 245-253 (2002).
4. V. Tomašić, S. Zrnčević, Z. Gomzi, Modelling and Simulation of a Monolith Reactor, *Polish J. Env. Studies*, **11**, III, 23-28 (2002).
5. F. Briški, N. Horgas, M. Vuković and Z. Gomzi, "Aerobic Composting of Tobacco Industry solid Waste – simulation of the process", *Clean Techn. Environ. Policy*, **5** (2003) 295-301.
6. F. Briški, Z. Gomzi, N. Horgas, M. Vuković, "Aerobic Composting of Tobacco Solid Waste", *ActaChimica Slovenica*, **50** (2003), 715-729.

7. F. Briški, Z. Gomzi, A. Hublin i M. Vuković, "Aerobno kompostiranje otpadaka voća i povrća: modeliranje procesa", *Kem.ind.*, 3, 95-102 (2003).
8. V. Tomašić and Z. Gomzi, "Experimental and theoretical study of NO decomposition in a catalytic Monolith reactor", *Chem. Eng. and Processing*, 43 (6) (2004) 765-774.
9. V. Tomašić, S. Zrnčević, Z. Gomzi, "Direct decomposition of NO in a monolith reactor: Comparison of mathematical models", *Catalysis Today*, vol. 90, 1-2, June 2004, p.77-83.
10. V. Kosar and Z. Gomzi, "In-depth analysis of the mathematical model of polyester thermosets curing", *Europ. Polymer J.*, 40 (12) (2004) p. 2793-2802.
11. V. Kosar and Z. Gomzi, "Cure Modeling of Polyester Thermosets in the Copper Mold", *Polymer-Plastics Technology and Engineering*, 43 (5) 2004 p.1277-1298.
12. K. Sertić, Z. Gomzi and T. Šarić, "Testing of Hydrodesulfurization process in small trickle-bed reactor", *Chem. Eng. J.* 106, 2 (2005) 105-110.

**Lecturer data**

**Surname, Name**                    **PhD. Stanka Zrnčević, full professor**  
**E-mail adress**                    szrnce@fkit.hr  
**Course**                                **CATALYTIC REACTION ENGINEERING**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Stanka Zrnčević (born in Zagreb, Croatia, January 2, 1946) is full professor of Chemical Engineering at the Faculty of Chemical Engineering and Technology University of Zagreb and the author or co-author over 60 papers maintains professional interests in chemical reaction engineering and catalysis and in particular catalyst deactivation and a variety of phenomena involving transport-kinetic interaction.

She received her BS (1969) and MS (1976) degrees in chemistry and PhD (1981) in chemical engineering from the Faculty of Technology University of Zagreb. From 1995 to 1997 she was Vice-dean and from 1997 to 2001 Dean of the Faculty of Chemical Engineering and Technology. She teaches catalysis and catalysts, catalytic reaction engineering, and laboratories that go with them. She is the member of Croatian Academy of Engineering, Croatian Society of Chemical Engineering, American Institute of Chemical Engineers and representative in the European WP Chemical Engineering in Catalyst Application.

**Date of last election**

16.09.1997.

**Referent publications of lecturer**

1. Rušić, D., Zrnčević, S.: Performance of Ni/Al<sub>2</sub>O<sub>3</sub> pellets poisoned by thiophene, Catalyst Deactivation, Studies in Sur.Sci.Catal., Vol. 111, Elsevier, 1997.
2. Tomašić, V., Gomzi, Z., Zrnčević, S.: Catalytic reduction of NO<sub>x</sub> over Cu/ZSM-5 catalyst, Appl.Catal.Environ. 18, 233, 1998.
3. Glavanović, T., Zrnčević, S.: Mass transfer resistance in palladium-catalysed hydrogenation of 1-methoxy-2,4-(nitrophenyl)-ethane, Catal.Today 48, 119, 1999.
4. Tomašić, V., Gomzi, Z., Zrnčević, S.: Reaction and mass transfer effects in a catalytic monolith reactor, React.Kinet.Catal.Lett. 77, 245, 2001.

**List of papers in last 5 years**

1. V. Tomašić, A. Geržina, Z. Gomzi and S. Zrnčević, Catalytic removal of no: the effect of cu loading and type of binder on catalytic properties of cu/zsm-5 catalyst, 12th Int.Con. on Catalysis (Ed. A. Corma et all.), Elsevier, Amsterdam 2000, p. 1493.
2. V. Tomašić, A. Geržina, S. Zrnčević, The influence of thermal treatment on the performance of ni/al<sub>2</sub>o<sub>3</sub> catalyst, Chem. Biochem. Eng. Q., 14 (2)(2000) 47.
3. V. Tomašić, Nove tehnologije za smanjenje emisija u atmosferu, Zbornik radova "Zaštita zraka '01", (ur. F. Valić, K. Šega), Hrvatsko udruženje za zaštitu zraka, Zagreb 2001, str. 215- 221.
4. V. Tomašić, Onečišćenje okoliša. emisija štetnih plinova u atmosferu, Kem. Ind. 50(1)(2001) 87.
5. V. Tomašić, Z. Gomzi, Development of the structured catalysts for the exhaust gas treatment, Chem. Biochem. Eng. Q., 15(3)(2001) 109.
6. V. Tomašić, Z. Gomzi, S. Zrnčević, Reaction and mass transfer effects in a catalytic monolith reactor, React. Kinet. Catal. Lett., 77(2)(2002) 245.
7. V. Tomašić, S. Zrnčević, Z. Gomzi, Modelling and simulation of a monolith reactor, Pol. J. Environ. Stud., 11 (Suppl. III)(2002), 23.

8. L. Zrnčević, T. Brajdić, V. Tomašić, Razgradnjadušikovog monoksida u katalitičkom monolitnom reaktoru, *Kem. Ind.* 52 (9)(2003) 421-426.
9. V. Tomašić, Z. Gomzi, Experimental and theoretical study of  $\text{NO}$  decomposition in a catalytic monolith reactor, *Chem. Eng. Proc.*, 43(6)(2004) 765.
10. V. Tomašić, S. Zrnčević, Z. Gomzi, Direct decomposition of  $\text{NO}$  in a monolith reactor: comparison of mathematical models, *Catal. Today* 90 (2004) 77.
11. V. Tomašić, Monolitni katalizatori i reaktori: osnovne značajke, priprava i primjena, *Kem. Ind.* 53 (12) (2004) 567.

### **Lecturer data**

**Surname, Name**                    **PhD. Đurđa Vasić-Rački, full professor**  
**E-mail adress**                    dvracki@fkit.hr  
**Course**                                **ADVANCES COURSE IN BIOCHEMICAL ENGINEERING**  
**Institution**                         Faculty of Chemical Engineering and Technology, Zagreb

### **Curriculum vitae**

Đurđa Vasić-Rački was born in 1946 in Zagreb, Croatia. She graduated in 1971 with B.Sc. degree in Chemical Engineering from Faculty of Chemical Engineering, University of Zagreb. After graduation she has employed as an assistant at Faculty of Chemical Engineering, Zagreb. She completed postgraduate studies in Chemical Engineering at Faculty of Chemical Engineering, University of Zagreb. She received MSc in 1976. In 1981 she received Ph.D. in Chemical Engineering at University of Zagreb. In 1983 she was appointed Assistant Professor and in 1985, Associated Professor in Chemical Engineering, at Faculty of Chemical Engineering, Zagreb. In 1992 she became a Full Professor. During 1985-86 she was a visiting researcher at Institute of Biotechnology, Research Center, Jülich, Germany. Since 1986 she is a member of editorial board of the journal "Chemical and Biochemical Engineering Quarterly" and a member of WP "Applied Biocatalysis" of EFB. Since 1993 she is a member of IOBB. Prof.dr.sc.Đurđa Vasić-Rački's research interests have been firmly in the area of biochemical engineering and, more specifically, enzyme reaction engineering.

### **Date of last election**

16.09.1997.

### **Referent publications of lecturer**

1. J.von Eysmond, Đ.Vasić-Rački and C. Wandrey, Acetic acid production by *acetogenium kivui* in continuous culture - kinetic studies and computer simulations, Appl. Microbiol. Biotechnol., 34 (1990) 344-349.
2. S.Bogdan, D.Gosak and Đ.Vasić-Rački, Mathematical modeling of liquid-liquid equilibria in aqueous polymer solution containig neutral proteinase and oxytetracycline using artificial neural network, Comp. Chem. Eng., 19 (1995) 791-796.
3. Vasić-Rački, Đurđa; Berović, Marin. Integrirani bioreaktorji // Biotehnologija / Raspor, Peter (ed.). Ljubljana : BIA, 1996. 551-567.
4. Zelić, Bruno ; Pavlović, Nediljko ; Delić, Vladimir ; Vasić-Rački, Đurđa. Kinetic model for the bioconversion of glucose to 2,5-diketo-d-gluconic acid. // *Bioprocess Engineering*. 21 (1999.) 45-50.
5. Krmelj, Vlasta ; Habulin, Maja ; Vasić-Rački, Đurđa ; Knez, Željko. Polymeric membranes for the use in high pressure membrane reactors // *Proceedings of the 5th International symposium on supercritical fluids*. Atlanta : COBISS-ID, 2000. 1-10.

### **List of papers in last 5 years**

1. Matijašević, Lj., Vasić-Rački, Đ.: Separation of glucose/fructose mixture: Counter-current adsorption system. Bioch. Eng. J. 4 (2000) 101-106.
2. Vasić-Rački, Đ.: History of industrial biotransformations-dreams and realities. In: Liese, A., Seelbach, K., Wandrey C. (Eds): Industrial Biotransformations.: Wiley-VCH, Weinheim, 2000, 3-29.
3. Giacometti, J., Giacometti, F., Milin, Č., Vasić-Rački, Đ.: Kinetic characterisation of enzymatic esterification in a solvent system: Adsorptive control of water with molecular sieves. J. Molecular Catalysis B: Enzymatic 11 (2001) 957-964.
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  6. Vasić-Rački, Đ., Bongs, J., Schörken, U., Sprenger, G. A., Liese, A.: Modeling of reaction kinetics for reactor selection in the case of L-erythrulose synthesis. *Bioprocess Biosyst. Eng.* 25 (2003) 285-290.
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  9. Zelić, B., Gostović, S., Vuorilehto, K., Vasić-Rački, Đ., Takors, R.: Process strategies to enhance pyruvate production with recombinant *Escherichia coli*: From repetitive fed-batch to ISPR with fully integrated electro dialysis. *Biotechnol. Bioeng.* 85 (2004) 638-646.
  10. Zelić, B., Vasić-Rački, Đ., Wandrey, C., Takors, R.: Modeling of the pyruvate production with *Escherichia coli* in a fed-batch bioreactor. *Bioprocess Biosyst. Eng.* 26 (2004) 249-258.
  11. Findrik, Z., Zelić, B., Bogdan, S., Vasić-Rački, Đ.: Model-based and experimental optimization using genetic algorithm. *Chem. Biochem. Eng. Q.* 18 (2004) 105-116.
  12. Wichmann, R., Vasić-Rački, Đ.: Lab-scale cofactor regeneration. In: Scheper, T. (Ed): *Technology Transfer in Biotechnology. Advances in Biochemical Engineering/Biotechnology.* Springer Verlag, 92 (2004) 225.
  13. Zelić, B., Vasić-Rački, Đ.: Process development and modeling of pyruvate recovery from model solution and fermentation broth. *Desalination.* 174 (2005) 267-276.
  14. Zelić, B., Vasić-Rački, Đ.: Primjena metodologije kemijskog inženjerstva u razvoju bioprocasa. *Kem. Ind.* (2005) U tisku.
  15. Vrsalović-Presečki, Ana., Vasić-Rački, Đ.: Modeling of alcohol dehydrogenase production in bakers yeast, *Process Biochem.* (2005) In print.

### **Lecturer data**

**Surname, Name**                    **PhD. Marko Rogošić, associate professor**  
**E-mail adress**                    mrogosic@fkit.hr  
**Course**                                **CHEMICAL ENGINEERING THERMODYNAMICS**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

### **Curriculum vitae**

Born on 9 March 1969 in Split, Croatia. Received B.Sc. degree at the Faculty of Chemical Engineering and Technology, University of Zagreb, in 1991, M.Sc. degree at the same Faculty in 1994 and Ph.D. degree in 1998 with the thesis entitled: "Investigations of the Miscibility and Interactions of Styrene and Acrylonitrile Copolymers". Since 1991, employed at the University of Zagreb, Faculty of Chemical Engineering and Technology as a junior researcher. In 1999 became assistant professor at the same faculty, elected for the graduate course Chemical Engineering Thermodynamics. His primary fields of research are physical chemistry of polymers and chemical engineering thermodynamics, as well as polymerization engineering. His list of publications comprises over 15 original scientific, professional, review and conference articles.

### **Date of last election**

21.06.2005.

### **Referent publications of lecturer**

1. M.Rogošić, H.J.Mencer, "Prediction of copolymer miscibility by the viscometric method", *Eur.Polym.J.*, **33**(5), 621-630 (1997)
2. B.Pintarić, M.Rogošić, H.J.Mencer, "Dilute Solution Properties of Cellulose Diacetate in Mixed Solvents", *J.Mol.Liq.*, **85**, 331-350 (2000)
3. M.Rogošić, I.Gusić, B.Pintarić, H.J.Mencer, "The Ellipsoidal Model of the Solubility Volume", *J.Mol.Liq.*, **108**, 135-150 (2003)
4. M.Rogošić, B.Pintarić, H.J.Mencer, "Parcijalni specifični volumen celuloznog diacetata u čistim i miješanim otapalima", *Polimeri* **20**(4), 217-225 (1999)
5. M.Rogošić, H.J.Mencer, "Osnove termodinamike polimernih mješavina", *Kem.ind.*, **46**(4), 145-170 (1997)

### **List of papers in last 5 years**

1. Pintarić, M. Rogošić, H.J. Mencer, "Dilute Solution Properties of Cellulose Diacetate in Mixed Solvents", *J.Mol.Liq.*, **85**, 331-350 (2000).
2. M. Rogošić, I. Gusić, B. Pintarić, H.J. Mencer, "The Ellipsoidal Model of the Solubility Volume", *J.Mol.Liq.*, **108**, 135-150 (2003).
3. A. Jukić, M. Rogošić, I. Bolarić, Lj. Tomašek and Z. Janović: "Viscometric study of miscibility and interactions of some polyolefines and poly(alkyl methacrylates) in dilute xylene solutions", *J.Mol.Liq.*, **112**, 161-169 (2004).
4. A. Jukić, M. Rogošić, K. Sarić i Z. Janović, "Optimizacija procesa terpolimerizacije i svojstava polimera na temelju alkil-metakrilata u otopini", *Kem.Ind.* **52**(10), 473-481 (2003).
5. M. Rogošić, Z. Matusinović, P. Gršković, "Priprava i karakterizacija fenol-formaldehidnih smola modificiranih dodatkom epoksida i p-krezola", *Zbornik proširenih sažetaka, Savjetovanje "Polimerni materijali i dodatci polimerima"*, Društvo za plastiku i gumu, Zagreb, 2002., str. 66-74.

6. M. Rogošić, I. Štagljar, Š. Ukić, "Primjena Wong-Sandlerovih pravila miješanja za proračun fazne ravnoteže kapljevina-para", Drugi znanstveno-stručni skup Programski sustav Mathematica u znanosti, tehnologiji i obrazovanju PrimMath[2003], Zagreb, rujan 2003., prihvaćeno za tisak.
7. T. Tomić, M. Rogošić, Z. Matusinović, N. Šegudović, "Dual Detection System in HPSEC of Copolymers ", New Polymeric Materials, ACS Symp. Ser., u tisku.
8. Z. Matusinović, T. Tomić, N. Šegudović, M. Rogošić, "Analysis of Molecular Mass Distributions of Styrene-Methylmethacrylate Copolymers Using Size Exclusion Chromatography Data, J. Separat. Sci., prihvaćeno za tisak.

**Lecturer data**

**Surname, Name**                    **PhD. Aleksandra Sander, assistant professor**  
**E-mail adress**                    asander@fkit.hr  
**Course**                                **SEPARATION PROCESSES**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Born: Zagreb, Croatia, March, 24, 1969.

B.A.: at Faculty of Chemical Engineering and Technology, University of Zagreb (1994)

M.Sc.: at Faculty of Chemical Engineering and Technology, University of Zagreb (1999)

Ph.D.: at Faculty of Chemical Engineering and Technology, University of Zagreb (2003)

Years within the firm: Since 1994. on Faculty of Chemical Engineering and Technology, University of Zagreb (2003)

Research interest: Heat and Mass Transfer, Thermal Separation Processes

Courses: Thermal Separation processes (lectures); Laboratory and Seminars (Transport Phenomena, Thermal Separation Processes)

**Date of last election**

21.06.2005.

**Referent publications of lecturer**

1. A. Sander, S. Tomas, D. Skansi, The Influence of Air Temperature on Effective Diffusion Coefficient of Moisture in the Falling Rate Period, *Drying Technology*, 16 (7), (1998), 1487-1499.
2. Jasna Prlić Kardum, Aleksandra Sander, Darko Skansi, Comparison of Convective, vacuum and Microwave Drying of Chlorpropamide, *Drying Tehnology*, 19 (1) (2001) 167-183.
3. Aleksandra Sander, Jasna Prlić Kardum, Darko Skansi, Transport properties in Drying of Solids, *Chem. Biochem. Eng. Q.*, 15 (3) 131-137, 2001.
4. Aleksandra Sander, Darko Skansi, Nenad Bolf, Heat and Mass Transfer Models in Convection Drying of Clay Slabs, *Ceramics International*, 29 (6) (2003) 641-653
5. D.Skansi, J.Prlić Kardum, A.Sander, Metode povećanja toplinske djelotvornosti kod sušenja papira, *Kem. Ind.*, 48 (7-8), (1999), 281-287

**List of papers in last 5 years**

1. Jasna Prlić Kardum, Aleksandra Sander, Darko Skansi, Comparison of Convective, vacuum and Microwave Drying of Chlorpropamide, *Drying Tehnology*, 19 (1) (2001) 167-183.
2. Aleksandra Sander, Jasna Prlić Kardum, Darko Skansi, Transport properties in Drying of Solids, *Chem. Biochem. Eng. Q.*, 15 (3) 131-137, 2001.
3. Aleksandra Sander, Darko Skansi, Nenad Bolf, Heat and Mass Transfer Models in Convection Drying of Clay Slabs, *Ceramics International*, 29 (6) (2003) 641-653.
4. Aleksandra Sander, Nenad Bolf, Jasna Prlić Kardum, Research On Dynamics And Drying Time In Microwave Paper Drying, *Chem. Biochem. Eng. Q.*, 17 (2) (2003) 159-164.
5. D.Skansi, J.Prlić Kardum, A.Sander, Metode povećanja toplinske djelotvornosti kod sušenja papira, *Kem. Ind.*, 48 (7-8), (1999), 281-287.
6. A. Sander, A. Glasnović, Procjena karakterističnih veličina u procesu sušenja, *Kem. Ind.*, 53, (2004) 109-115.
7. A. Sander, A. Glasnović, Mathematical Modelling of Drying, 15th International

Congress of Chemical and Process Engineering, CHISA 2004, Prag.

8. J. Prlić-Kardum, A. Sander, A. Glasnović, Batch Crystallization of KCl: The Influence of the Cooling and Mixing Rate on the Granulometric Properties of Obtained Crystals, Chem. Biochem. Eng. Q.(2005).

**Lecturer data**

**Surname, Name**            **PhD. Ivica Gusić, associate professor**  
**E-mail adress**            igusic@fkit.hr  
**Course**                      **AN OVERVIEW OF MATHEMATICS FOR ENGINEERING**  
**Institution**                Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Ivica Gusić was born on October 8, 1954. in Grab (nearby Sinj). He received his B.Sc. in 1977, his M.A. in 1983 with thesis *The Enriques classification of two-dimensional algebraic varieties*, and his Ph.D. in 1996 with thesis *A contribution to the arithmetic of elliptic curves and abelian varieties*, under the leadership of academician Marko Tadić (all from the University of Zagreb). He participates on The seminar for representation of Lie groups and on The seminar for number theory and algebra (and he is a coleader of it). He is interested in arithmetic of algebraic varieties, number theory, algebra, ordered structures, teaching of mathematics, popularisation of mathematics and mathematics terminology.

**Date of last election**

23.09.2002.

**Referent publications of lecturer**

1. Ivica Gusić, Convex functions on lattice ordered groups, Ann.Math. Silesianae 11, 1997, 7-20
2. Ivica Gusić, Note on certain inequality, Journal of Math. Analysis and Appl. 217, 1998, 687-692
3. Ivica Gusić, A topology on lattice ordered groups, Proc. of AMS Vol. 126, No 9, Sept. 1998, 2593-2597

**List of papers in last 5 years**

1. Algebraic independence of polynomials, Acta Aritmetica, XCII.1 (2000), 27-29.
2. Remark on Homomorphisms of Groups, Annales Math. Silesianae 14 (2000), 81-83.
3. On Isogenies of Elliptic Curves, Glasnik Matematički, Vol 35 (55) (2000), 335-337.
4. The ellipsoidal model of the solubility volume (with Marko Rogošić, Božica Pintarić and Helena Jasna Mencer), Journal of Molecular Liquids, 108/1-3 (2003) 135-150.
5. A characterization of linear polynomials, (prihvaćeno u Journal of Number Theory).
6. Note on generalized derivations of prime rings (prihvaćeno u Glasnik Matematički).

### *Lecturer data*

**Surname, Name**            **PhD. Želimir Kurtanjek, associate professor**  
**E-mail address**            zkurt@pbf.hr  
**Course**                        **MATHEMATICAL MODELING**  
**Institution**                 Faculty of Food Technology and Biotechnology, Zagreb

### *Curriculum vitae*

Želimir Kurtanjek in 1979 received Ph. D. degree in chemical engineering from University of Houston, TX, USA. His mentor was Prof. Dan Luss from the Laboratory for Reaction Engineering. He completed his postdoctoral studies with Prof. G. Froment at the Department of Chemical Engineering, University of Gent, Belgium.

Presently he is employed at Faculty of Food Technology and Biotechnology, University of Zagreb as a professor of chemical engineering and is teaching reactor engineering, mathematical modelling and process control to students of biotechnology.

In his scientific work he is interested in modelling and control of reactors, modelling of bioprocesses and food engineering, and application of AI methods in process control. He has published over 50 papers in international and national journals. He is editor of international journal Chemical and Biochemical Engineering Quarterly, and is a member of editorial board of international journal Food Technology and Biotechnology.

### *Date of last election*

1.12.2004.

### *Referent publications of lecturer*

1. Ž. Kurtanjek, "Principal component analysis of bioreactor fed-batch operation by computer simulation", Mathematics and Computers in Simulation, **44**(3) 1997.
2. J. Strohschein, Ž. Kurtanjek, "Adaptive on-line optimisation of a chemical reactor system", Chem. Biochem. Eng. Q., **11** (4) 169-175 (1997).
3. Ž. Kurtanjek, "Principal Component Analysis of Integrated Chemical Plants", Chem. Biochem. Eng. Q. **11** (1) 25-29 (1997).
4. Ž. Kurtanjek, "Structure of Principal Component Based Neural Network Models of Dynamic Systems", Journal of Computing and Information Technology -CIT, **3** (1) 1-8, (1995).
5. Ž. Kurtanjek, G.F. Froment, "Investigation of Surface Phenomena Associated With Oscillating Oxidation of CO on Pt", Chem. Eng. Sci., **41** (12) 3189-3201, (1991).

### *List of papers in last 5 years*

1. Čurlin, M. Matić, M. Matošić, I. Mijatović, Ž. Kurtanjek, "Effects of Hydraulic Residence Time and Mixing on Wastewater Treatment in a Membrane Reactor", Chem. Biochem. Eng. Q. **18** (2) 97-104 (2004).
2. Vranešić, Ž. Kurtanjek, A.M. P. Santos, F. Maugeri, "Optimisation of Inulinase Production by Kluyveromyces fragilis", Food Technology and Biotechnology, **40** (1) 67-73 (2002).
3. Ž. Kurtanjek, "Interaction of hydrodynamic environment on performance of homogeneous bioreactors with enzyme kinetic models", Current Studies of Biotechnology, **2** 89-95 (2001).
4. D. Sinčić, Ž. Kurtanjek "Demulsification analysis by neural networks", Nafta, **51** (9) 303-308 (2000).
5. Ž. Kurtanjek, "Modeling of chemical reactor dynamics by nonlinear principal components", Chem. Intell. Lab. Systems, **46**, 149-159, (1999).

6. S. Matošić, Ž. Kurtanjek, M. Bošnjak, B. Šlaus, "Applicability of the three dimensional growth model in description of *Mucor miehei* NCAIM 5238 cultivation and renin biosynthesis", Chem. Bioche. Eng. Quart., 15 (3), 98-101, 2001.

### ***Lecturer data***

**Surname, Name**                    **PhD. Antun Glasnović, full professor**  
**E-mail adress**                    aglasnov@fkit.hr  
**Course**                                **TRANSPORT PHENOMENA**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

### ***Curriculum vitae***

Antun Glasnović, born in Zagreb, Croatia, December 6, 1948. Education: Chemical Technical School (1967) ; B. Sc. (1972); M. Sc. (1974) and Ph. D. (1980) at Faculty of Technology, University of Zagreb.

Employment and duties: From 1972. he is on Faculty of Chemical Engineering and Technology, University of Zagreb; teaching assistant, assistant professor, associate professor, and from 2003. Professor of Chemical Engineering. From 2002. he is Faculty Vice-dean. Study visits: University of Tecnology, Dresden, Germany (1989).

Courses: Transport Phenomena, Mechanics of Fluids, Rheology, Unit Operation. Research interest: Momentum transport ( two phase flow, Non-Newtonian fluid dynamics, Mechanical separation process (characterization of coarse disperse systems, size reduction, filtration). Membership: Croatian Society of Chemical Engineering ( president from 2001).

### ***Date of last election***

08.07.2003.

### ***Referent publications of lecturer***

1. S. Katanec, R. Franković, A Glasnović, Procjena pada tlaka trenjem pri horizontalnom dvofaznom strujanju u prijelaznom hidrodinamičkom području, *Kem.ind.*, **44**, (1995), 137-140.
2. G. Matijašić, A. Glasnović, Measurement and Evalution on Drag Coefficient Settling of Spherical Particles in Pseudoplstics Fluids, *Chem. Biochem. Eng. Q.* **15** (1), (2001), 21-24.
3. G. Matijašić, A. Glasnović, Influence of Dispersed Phase Characteristics on Rheological Behaviour of Suspensions, *Chem. Biochem. Eng. Q.*, **16** (4), (2002), 165-172.

### ***List of papers in last 5 years***

1. A. Meteš, N. Koprivanac, A. Glasnović, Flocculation as a Treatmant Method for Printing Ink Wastewater, *Water Env. Res.* , **72**, (2000), 680-688.
2. A. Glasnović, M. Hraste, G. Matijašić, S. Osmak, Utjecaj raspodjele veličina suspendiranih čestica na svojstva dubinskog filtra, *Kem. Ind.* , **49**, (2000), 513-518.
3. K. Košutić, A. Glasnović, A. Hadžić, Mogućnost procjene indeksa замуćenja vode temeljem rezultata dobivenih nefelometrijskom metodom, *Kem. Ind.* **49**, (2000), 443-448.
4. G. Matijašić, A. Glasnović, Measurement and Evaluation on Drag Coefficient Settling of Spherical Particles in Pseudoplastics Fluids, *Chem. Biochem. Eng. Q.* **15** (1), (2001), 21-24.
5. G. Matijašić, A. Glasnović, Influence of Dispersed Phase characteristics on Rheological Behavior of Suspensions, *Chem. Biochem. Eng. Q.* , (2002).
6. A. Sander, A. Glasnović, Procjena karakterističnih veličina u procesu sušenja, *Kem. Ind.* , **53**, (2004) 109-115.
7. A. Sander, A. Glasnović, Mathematical Modelling of Drying, 15th International Congress of Chemical and Process Engineering, CHISA 2004, Prag.

8. J. Prlić-Kardum, A. Sander, A. Glasnović, Batch Crystallization of KCl: The Influence of the Cooling and Mixing Rate on the Granulometric Properties of Obtained Crystals, Chem. Biochem. Eng. Q. (2005).

**Lecturer data**

**Surname, Name**                    **PhD. Felicita Briški, associate professor**  
**E-mail adress**                    fbriski@fkit.hr  
**Course**                                **TREATMENT PROCESSES OF WASTE SUBSTANCES**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

In 1975 graduated at Faculty of Technology, Department of Biotechnology, University of Zagreb. From 1979 worked as microbiologist and after it as head of Department of Development and Technical-Technological Control in mineral water filling facility Badelj-Jamnica. Master of science degree got in 1984, and in 1987 started to work as research assistant at Faculty of Chemical Engineering and Technology, Division of Industrial Ecology. PhD got in 1991 and from 1991-1995 had a position of research fellow. From 1995 is assistant professor. As author and co-author has published 20 scientific works in national and international journals and was participant at many national and international conferences. Speaks, reads and writes English, uses German and Hungarian.

**Date of last election**

24.09.2001.

**Referent publications of lecturer**

1. M. Vuković, F. Briški, L. Foglar, Uklanjanje fulvinske kiseline iz vodene otopine s čistim i mješovitom kulturom mikroorganizama, Kem. Ind. **48** (1999) 267-271.
2. Ž. Filipović-Kovačević, L. Sipos, F. Briški, Biosorption of chromium, copper, nickel and zinc ions onto fungal pellets of *Aspergillus niger* 405 from aqueous solutions, Food Technol. Biotechnol., **38** (2000) 211-217.
3. L. Foglar, F. Briški, Wastewater denitrification process-the influence of methanol and kinetic analysis, Process Biochem., **39** (2003) 95-103.
4. F. Briški, N. Horgas, M. Vuković, Z. Gomzi, Aerobic composting of tobacco industry solid waste Simulation of the process, Clean Technol Environ Policy, **5** (2003) 295-301.
5. F. Briški, Z. Gomzi, N. Horgas, M. Vuković, Aerobic composting of tobacco solid waste, Acta Chim. Slov., **50** (2003)715-729.

**List of papers in last 5 years**

1. F. Briški, L. Sipos, M. Petrović, Distribution of faecal indicator bacteria and nutrients in the Krka river in the region of the Krka National Park, Per.Biol., **102** (2000) 273-281.
2. Ž. Bajza, F. Briški, A. Hublin, Smanjenje štetnih sastojaka u mulju otpadnih voda kožara, Gospodarstvo i okoliš **46** (2000) 502-505.
3. F. Briški, R. Jagić, D. Krstić, Microbial species on a polychromed sculpture from ruined church, Studies in Conservation, **46** (2001)14-22.
4. L. Foglar, F. Briški, Wastewater denitrification process-the influence of methanol and kinetic analysis, Process Biochem., **39** (2003) 95-103.
5. F. Briški, N. Horgas, M. Vuković, Z. Gomzi, Aerobic composting of tobacco industry solid waste- Simulation of the process, Clean Technol Environ Policy, **5** (2003) 295-301.
6. F. Briški, Z. Gomzi, N. Horgas, M. Vuković, Aerobic composting of tobacco solid waste, Acta Chim. Slov., **50** (2003)715-729.
7. F. Briški, Z. Gomzi, A. Hublin, M. Vuković, Aerobno kompostiranje otpadaka voća i

- povrća: modeliranje procesa, *Kem. Ind.* 52 (2003) 95-102.
8. R. Budin, I. Sutlović, A. Mihelić-Bogdanić, F. Briški, Smanjenje toplinskog i kemijskog opterećenja okoliša u procesu proizvodnje FDPE, *Sigurnost* 45 (2003)1-11.
  9. T. Štembal, M. Markić, F. Briški, L. Sipos, Rapid start-up of biofilters for removal of ammonia, iron and manganese from groundwater, *J. Water Supply: Res. and Technol.– Res. and Technol., Aqua*, 53(2004)509-518.
  10. T. Štembal, M. Markić, N. Ribičić, F. Briški, L. Sipos, Biological removal of ammonia, iron and manganese from groundwater of northern Croatia–pilot plant studies, *Proc. Biochem.* 40(2005)327-335.
  11. L. Foglar, F. Briški, L. Sipos, M. Vuković, High nitrate removal from synthetic wastewater with mixed bacterial culture, *Bioresource Technology*, 96(2005)879-888.

**Lecturer data**

**Surname, Name**                    **PhD. Rajka Budin, full professor**  
**E-mail adress**                    rbudin@fkit.hr  
**Course**                                **INDUSTRIAL ENERGY**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Rajka Budin, born in Zagreb, holds a B.Sc., M.D. and Ph.D. in chemical engineering from Faculty of Chemical Engineering and Technology, University of Zagreb. She works at the same Faculty, Department of thermodynamics and energy since 1962 as assistant, assistant professor and presently full professor. She teaches several courses on undergraduates and postgraduates courses. In 1979/80 she joined the Department of Mechanical and Industrial Engineering at the University of Illinois Urbana-Champaign as an assistant professor. Dr. Budin has published numerous articles in the areas of energy and power especially in energy savings strategies.

Dr.sc. Rajka Budin received the Fran Bošnjaković and Hrvoje Požar award for research on development of the energy management, as well as J.J.Strossmayer for book in the field of technical knowledges..

**Date of last election**

16.09.1997.

**Referent publications of lecturer**

1. R.Budin, A.Mihelić-Bogdanić, V.Filipan, Energy conservation using recuperative drying process, Energy Convers. Mgmt Vol. 37, no.9, (1996),pp (1393-1399).
2. R.Budin,A.Mihelić-Bogdanić, Heat recovery in polyester production, Applied Thermal Engineering Vol.17, No7 July 1997, pp 661-665.
3. R.Budin,A.Mihelić-Bogdanić,V.Filipan,The solarized evaporation process Energy Convers. Mgmt Vol.39 , no.11,May 1998 (1169-1175).
4. A.Mihelić-Bogdanić,R.Budin,Heat recovery in thermoplastic production, Energy Convers. Mgmt Vol. 43, no.8 , (2002),pp (1079-1089)
5. R.Budin, A.Mihelić-Bogdanić, I.Sutlović,F.Briški, Smanjenje toplinskog i kemijskog opterećenja okoliša umprocesu proizvodnje HDPE, Sigurnost, Vol.45,no.1 (2003), 1-11.

**List of papers in last 5 years**

1. Udžbenik: R. Budin, A. Mihelić-Bogdanić, Osnove ehničke termodinamike, II. dopunjeno i izmijenjeno izdanje, Školska knjiga Zagreb,2002.
2. R. Budin, A. Mihelić-Bogdanić, I. Sutlović, V. Filipan, Kiln Hot Air Recovery,Proc.of the Int. Cong."Energy and Environment"2000, 17th Scientific Conf. on Energy and Environment, Opatija 2000,(287-290).
3. Sutlović,A.Mihelić-Bogdanić,R.Budin, Energy analysis of process in garment industry, Annals of DAAAM for 2000&Proc.of the 11th Intern. DAAAM Symposium, Opatija 2000 (453-454).
4. Mihelić-Bogdanić,R.Budin,I.Sutlović,Solar energy system and waste heat recovery in industrial process, Proc.of the World Renewable energy Con.VI (WREC 2000)

Brighton,(1094-1097).

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6. R. Budin,I.Sutlović, A.Mihelić-Bogdanić, Kiln flue gas heat recovery, Proc of the 5th Inter. Conf. on New Energy Systems and Conversions, Shanghai 2001,(375-377).
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12. A.Mihelić-Bogdanić,R.Budin,I.Sutlović,Condensate and Flue Gases Heat Recovery, Proc of the Int.Cong., Energy and Environment.2002,18th Scientific Conf. on Energy and Environment, Opatija 2002, Vol.II (19-24).
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14. V.Filipan,R.Budin,A.Mihelić-Bogdanić,The possibilities of energy saving in textile industry, 1st. Int.Textile, Clothing and Design Conf., Book of Proc.,Dubrovnik 2002, (682-687).
15. A.Mihelić-Bogdanić,R.Budin, The application of heat recovery in low temperature Stirling engine, Proc.of the 11th ISEC, Rome 2003, (285-288).
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18. A.Mihelić-Bogdanić,R.Budin,I.Sutlović,V.Filipan,Efficient use of energy in selected industry plants, 2st. Int. Textile, Clothing and Design Conf., Book of Proc.,Dubrovnik 2004,(1002-1007).

### **Lecturer data**

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**Course**                                **SYNTHESIS AND DESIGN OF PROCESSES**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

### **Curriculum vitae**

Name and position: Ljubica MATIJAŠEVIĆ, Assistant Professor

Institution: Faculty of Chemical Engineering and Technology, University of Zagreb, Department of Reaction Engineering and Catalysis  
Professional schools attended: Degree B.Sc (1974), Faculty of Technology, University of Zagreb, M.Sc (1981), Faculty of Chem.Eng.& Technology, University of Zagreb, Ph.D (1992), Faculty of Chem.Eng.& Technology, University of Zagreb  
Memberships: : HDKI, *Consalting Club* Croatian Cleaner production centre , NewYork Academy of Sciences, American Chemical Society, biography in Who`sWho in the World, Who`sWho in the Science & Technology. Main duties consisted in supervising students, in laboratories for Unit operations, Reaction Engineering and Catalysis including the major aspect of Plant Design as related to the overall design project. The results of scientific research were presented at the international congresses and published in several publications.

### **Date of last election**

20.03.2000.

### **Referent publications of lecturer**

1. Matijašević, Lj., Beer, E.: Application of heat pump. Feasibility study, Chem. Eng. Education, 1, 34 (2000) 68 – 73.
2. Matijašević, Lj., Otmačić, H.:Energy recovery by Pinch technology, Applied Thermal Engineering 22/4 (2002) 477-484.
3. Matijašević, Lj., Plavljanić, Č., Vasić-Rački, Đ., Dynamic simulation of the integrated bioreactor, Bioprocess Engineering 14 , (1996) 255-259.
4. Host, M., Matijašević, Lj., Cleaner production in Croatia, Workshop “Sustainable water management and industrial development”, Proceeding (CD), Bucharest, 7-9, May 2001.
5. Matijašević, Lj., Beer, E., Maren, M., Fabek, R., Cikač, Z.:The absorption of exhaust gases during the urea production, III. International conference ZAŠTITA ZRAKA 2001,Proceeding, Šibenik, 26.-29. Septembre 2001.

### **List of papers in last 5 years**

1. Lj.Matijašević, Đ.Vasić-Rački, Separation of glucose/ fructose mixtures. Counter current adsorption system, Biochemical Engineering Journal, 4 (2000) 101-106.
2. Lj.Matijašević, E. Beer, Application of heat pump. Feasibility study, Chem. Eng. Education, 1, 34 (2000) 68 – 73.
3. M. Host, Lj. Matijašević, Cleaner production in Croatia, Workshop “Sustainable water management and industrial development”, Proceeding (CD-full text), Bucharest, 5/2001,1-5.
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5. Lj. Matijašević, Adaptation of unit operation for separation i-pentane, Slovenski kemijski

- dnevi 2004, Proceeding (CD-full text), Maribor, 9/2004, 1-8.
6. Lj. Matijašević, Smanjenje emisija na postrojenju NPK gnojiva, Upravljanje resursima čimbenik poslovnog uspjeha, HIS, Zbornik radova, 11/2004, 291-299.
  7. Lj. Matijašević, E. Beer, M. Maren, R. Fabek, Z. Cikač, Apsorpcija otpadnih plinova pri procesu proizvodnje uree, Zaštita zraka, Zbornik, 9/2001, 223 – 229.
  8. H. Otmačić, Lj. Matijašević, Efikasno korištenje energije-čistija proizvodnja, VI. Međunarodni simpozij Gospodarenje otpadom, ZAGREB 2000, 11/2000, 659-671.
  9. Lj. Matijašević, E. Beer, R. Fabek, I. Dejanović, Absorption of the exhaust gases in urea production, Separation and Purification Technology, 2005 (poslano u tisak).
  10. R. Fabek, Lj. Matijašević, Parametric analysis of urea synthesis section, Industrial & Engineering Chemistry Research, 2005 (poslano u tisak).

**Lecturer data**

**Surname, Name**                    **PhD. Vesna Tomašić, assistant professor**  
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**Course**                                **MONOLITHIC AND MEMBRANE REACTORS**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Ms. Vesna Tomašić was born in Sisak in 1964. In 1990 graduated from the Faculty of Technology in Zagreb. In 1991 applied for postgraduate study of engineering chemistry, course Chemical Engineering. Master's degree in chemical engineering, then doctorate (in 1999). From 2002. she has worked as an assistant professor. At the Department of Reaction Engineering and Catalysis conducts the exercises in «Catalysis and Catalysts», «Reaction Engineering» and «Catalytic Reaction Engineering». Since 1999. acts as a mentor in «Chemical Engineering Exercises». From 1990. is collaborator in three scientific-research projects supported by the Croatian Ministry of Science and Technology and a principal investigator in the project of young researchers. Ms. Vesna Tomašić works on catalytic reaction engineering, with special emphasis on the topics related to air protection. She has published 17 (+3 in press) scientific papers, of which 11 (+2 in press) in journals and proceedings with international referee, and has participated at 11 international and 15 local scientific and professional conferences.

**Date of last election**

14.10.2002.

**Referent publications of lecturer**

1. V. Tomašić, Z. Gomzi, Development Of The Structured Catalysts For The Exhaust Gas Treatment, Chem. Biochem. Eng.Q., 15(3)(2001) 109.
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3. V. Tomašić, S. Zrnčević, Z. Gomzi, Modelling and Simulation of a Monolith Reactor, Pol. J. Environ. Stud., 11 (Suppl. III)(2002), 23.
4. V. Tomašić, Z. Gomzi, Experimental and Theoretical Study of NO Decomposition in a Catalytic Monolith Reactor, Chem. Eng. Proc. 2004 (u tisku).
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10. V. Tomašić, S. Zrnčević, Z. Gomzi, Direct decomposition of no in a monolith reactor: comparison of mathematical models, *Catal. Today* 90 (2004) 77.
11. V. Tomašić, Monolitni katalizatori i reaktori: osnovne značajke, priprava i primjena, *Kem. Ind.* 53 (12) (2004) 567.

**Lecturer data**

**Surname, Name**                    **PhD. Veljko Filipan, assistant professor**  
**E-mail adress**                    vfilipan@fkit.hr  
**Course**                                **MECHANICAL ASPECTS OF PROCESS EQUIPMENT**  
**Institution**                        Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Veljko Filipan was born in 1957 in Hlapičina. He graduated mechanical engineering and obtained master's and doctoral degrees at the Faculty of Mechanical Engineering and Naval Architecture University of Zagreb. From 1981 to 1990 he worked in Electro technical institute in Zagreb. From 1991 he has been employed at the Faculty of Chemical Engineering and Technology University of Zagreb, first as an assistant and later as a senior lecturer and assistant professor, teaching the subjects of Mechanical Engineering, Engineering Thermodynamics and Process Equipment. He has been involved in some scientific projects and in solving the particular problems for domestic industry. He authored many scientific and professional articles for journals and proceedings and participated at numerous domestic and international congresses. He also wrote more scientific and professional reports, studies and surveys. He is an expert mechanical engineer and member of Croatian Chamber of Architects and Building Engineers. He is active member of some domestic and international scientific and professional associations and of some technical committees of Croatian State Office for Standardization and Metrology. He can read and write English, German and Russian.

**Date of last election**

08.05.2000.

**Referent publications of lecturer**

1. V. Filipan, Z. Virag, A. Bergant: "Mathematical Modelling of a Hydraulic Ram Pump System", *Strojniški vestnik / Journal of Mechanical Engineering*, Vol. 49, 2003., No. 3; pp. 137-149.
2. L. Sipos, V. Filipan: "Idejno tehnološko rješenje predtretmana otpadnih voda tvornice Unitas d.d. na lokaciji Getaldićeva 1 u Zagrebu", *Elaborat, Fakultet kemijskog inženjerstva i tehnologije, Zagreb, 2002.*
3. R. Budin, A. Mihelić-Bogdanić, V. Filipan: "Energy Efficient Industrial Evaporator System", *The 4th International Conference on New Energy Systems and Conversion, Osaka 1999., Proceedings, pp. 171-174.*
4. P. Kovaček, D. Kufner, V. Filipan: "Obnova hidrogeneratora u HE Varaždin", *Energija, Vol. 47, 1998., br. 2, str. 117-122.*
5. Mihelić-Bogdanić, R. Budin, V. Filipan: "Flat Plate Engine with Waste Heat Recovery", *The 3rd International Thermal Energy and Environmental Congress, Marrakesh 1997., Proceedings, Vol. 1, pp. 145-147.*

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1. R. Budin, A. Mihelić-Bogdanić, I. Sutlović, V. Filipan: "Kiln Hot Air Recovery", *Int. Congress "Energy and the Environment", Opatija 2000., Proc., Vol. 1, pp. 287-290.*
2. V. Filipan, R. Budin, A. Mihelić-Bogdanić: "Improvements of Dyeing Processes by Heat Recovery", *6th World Renewable Energy Congress, Brighton - UK 2000., Proceedings, Part IV, pp. 2626-2629.*
3. V. Filipan: "Hlađenje generatora HE Vinodol – Rješenje hlađenja i ventilacijsko toplinski proračun novog generatora hidroelektrane Vinodol", *Elaborat, Končar- GIM, Zagreb 2000.*
4. V. Filipan: "Sniženje temperature tehnoloških otpadnih voda primjenom sustava rekuperacije otpadne topline u Tvornici konca Unitas Zagreb", *Elaborat, Tvornica*

- konca Unitas Zagreb, 2000.
5. L. Sipos, V. Filipan: "Ekspertiza otpadnih voda s prijedlogom tehnoloških rješenja za predtretman otpadnih voda u tvornici Unitas d.d. Pogon Dorada", Studija, Fakultet kemijskog inženjerstva i tehnologije, Zagreb, 2001.
  6. I. Sutlović, R. Budin, A. Mihelić-Bogdanić, V. Filipan: "Energy saving in process of HDPE production", The 16th International Symposium on Heating, Refrigerating and Air Conditioning, Zagreb 2001., Proceedings, pp. 338-342.
  7. V. Filipan, Z. Milojković, B. Tomičić: "Mogućnosti poboljšanja hidrogeneratora obnovom", Peto savjetovanje hrvatskog komiteta CIGRE, Cavtat 2001., Zbornik radova Grupa 11 – Rotacijski strojevi, referat 11-08, str. 71-81.
  8. L. Sipos, V. Filipan: "Idejno tehnološko rješenje predtretmana otpadnih voda tvornice Unitas d.d. na lokaciji Getaldićeva 1 u Zagrebu", Studija, Fakultet kemijskog inženjerstva i tehnologije, Zagreb, 2002.
  9. I. Sutlović, R. Budin, V. Filipan: "Solar Energy in Evaporation Process", The 7th World Renewable Energy Congress, Köln – Njemačka 2002., Proceedings on CD-ROM, 4 pp.
  10. V. Filipan, R. Budin, A. Mihelić-Bogdanić: "The possibilities of energy saving in textile industry", The 1st International Textile, Clothing & Design Conference, Dubrovnik 2002., Proceedings, pp. 682-687.
  11. V. Filipan, P. Ćirić, S. Ciglenečki: "Energetski, ekonomski i ekološki aspekti iskorištavanja procesnog kondenzata", Međunarodni kongres "Energija i zaštita čovjekove okoline", Opatija 2002., Zbornik radova, Sv. II, str. 25-33.
  12. S. Ciglenečki, D. Jovičić, V. Filipan: "Energetski i ekološki aspekti separatora ulja u EL-TO Zagreb", 5. međunarodno znanstveno stručno savjetovanje "Energetska i procesna postrojenja", Dubrovnik - Hrvatska 2002, Zbornik radova na CD-ROM-u, 8 str.
  13. I. Sutlović, R. Budin, A. Mihelić-Bogdanić, V. Filipan: "Sniženje specifične potrošnje energije u procesu bojadisanja", 17. međunarodni simpozij o grijanju, hlađenju i klimatizaciji, Zagreb 2003., Zbornik radova, str. 299-306.
  14. V. Filipan, Z. Virag, A. Bergant: "Mathematical Modelling of a Hydraulic Ram Pump System", Strojniški vestnik / Journal of Mechanical Engineering, Vol. 49, 2003., No. 3; pp. 137-149.
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  16. V. Filipan, R. Budin, I. Sutlović, A. Mihelić-Bogdanić: "The possibilities of condensate reusing in textile finishing processes", The 2nd International Textile, Clothing & Design Conference, Dubrovnik 2004., Proceedings, pp. 992-997.
  17. I. Sutlović, R. Budin, A. Mihelić-Bogdanić, V. Filipan: "Energetsko vrednovanje procesa polimerizacije", Sigurnost, Vol. 46, 2004., No. 2, pp. 97-108.
  18. V. Filipan, R. Budin, A. Mihelić-Bogdanić, I. Sutlović: "Energy efficient lye recovery system", International Congress "Energy and the Environment" - 19th Scientific Conference on Energy and the Environment, Opatija 2004., Proc., Vol II, pp. 99-106.

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**Course****ADVANCE COURSE IN BIOREACTION ENGINEERING****Institution**

Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Bruno Zelić PhD was born 1973 in Osijek. In 1996 he completed his undergraduate studies in chemical engineering and received his B. S. in chemical engineering from the Faculty of Chemical Engineering and Technology, University of Zagreb. From 1996 to 2003 he worked as assistant at the Faculty of Chemical Engineering and Technology. In 1999 he completed his graduate studies in chemical engineering and received his M. S. in chemical engineering from the Faculty of Chemical Engineering and Technology. In 2003 he received his PhD in chemical engineering at the University of Zagreb. From 2003 he worked as assistant professor at the Faculty of Chemical Engineering and Technology. 6 scientific and professional publications, 2 patent applications, and 9 oral and poster presentations on the international conferences present his scientific work.

**Date of last election**

27.10.2003.

**Referent publications of lecturer**

1. B. Zelić, N. Pavlović, V. Delić, Đ. Vasić-Rački: Kinetic model for the bioconversion of glucose to 2,5-diketo-D-gluconic acid. *Bioprocess Eng.* 21 (1999) 45-50
2. B. Zelić, T. Gerharz, M. Bott, Đ. Vasić-Rački, C. Wandrey, R. Takors: Fed-batch Process for Pyruvate Production by Recombinant *Escherichia coli* YYC202 strain. *Eng. Life Sci.* 3 (2003) 299-305
3. Zelić, Bruno; Gostović, Srđan; Vuorilehto, Kai; Vasić-Rački, Đurđa; Takors, Ralf: Process strategies to enhance pyruvate production with recombinant *Escherichia coli*: From repetitive fed-batch to ISPR with fully integrated electrodialysis. *Biotechnol. Bioeng.* 85 (2004) 638-646
4. Zelić, Bruno; Pavlović, Nediljko; Delić, Vladimir; Vasić-Rački, Đurđa: Optimization of pH and temperature in the process of bioconversion of glucose to 2, 5-diketo-D-gluconic acid. *Chem. Biochem. Eng. Q.* 16 (2002) 7-11
5. B. Zelić, Đ. Vasić-Rački, C. Wandrey, R. Takors: Modeling of the pyruvate production with *Escherichia coli* in a fed-batch bioreactor. *Bioprocess. Biosyst. Eng.* (2004) In print

**List of papers in last 5 years**

1. Gerharz, T., Zelić, B., Takors, R. Bott, M.: Produktion von Pyruvat aus Glucose mit *Escherichia coli*. U: Heiden, S., Erb, R. (Eds): *Biokatalyse*. Spektrum akademischer Verlag GmbH, Heidelberg, 2001, 29-33.
2. Zelić, B., Pavlović, N., Delić, V., Vasić-Rački, Đ.: Optimization of pH and temperature in the process of bioconversion of glucose to 2, 5-diketo-D-gluconic acid. *Chem. Biochem. Eng. Q.* 16 (2002) 7-11.

3. Zelić, B., Gerharz, T., Bott, M., Vasić-Rački, Đ., Wandrey, C., Takors, R.: Fed-batch Process for Pyruvate Production by Recombinant *Escherichia coli* YYC202 strain. *Eng. Life Sci.* 3 (2003) 299-305.
4. Zelić, B., Gostović, S., Vuorilehto, K., Vasić-Rački, Đ., Takors, R.: Process strategies to enhance pyruvate production with recombinant *Escherichia coli*: From repetitive fed-batch to ISPR with fully integrated electrodialysis. *Biotechnol. Bioeng.* 85 (2004) 638-646.
5. Zelić, B., Vasić-Rački, Đ., Wandrey, C., Takors, R.: Modeling of the pyruvate production with *Escherichia coli* in a fed-batch bioreactor. *Bioprocess Biosyst. Eng.* 26 (2004) 249-258.
6. Findrik, Z., Zelić, B., Bogdan, S., Vasić-Rački, Đ.: Model-based and experimental optimization using genetic algorithm. *Chem. Biochem. Eng. Q.* 18 (2004) 105-116.
7. Zelić, B., Vasić-Rački, Đ.: Process development and modeling of pyruvate recovery from model solution and fermentation broth. *Desalination.* 174 (2005) 267-276.
8. Biwer, P. A., Zubert, T. P., Zelić, B., Gerharz, T., Bellmann, K., Heinzle, E.: Modeling and analysis of a new process for pyruvate production. *Ind. Eng. Chem. Res.* (2005) In print.

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**Course****ENVIRONMENTAL ENGINEERING AND MANAGEMENT****Institution**

Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Born in Zagreb. Bachelor degree 1967, Faculty of Technology. Master of science degree 1974, Faculty of Natural Science. Ph.D. 1981, Faculty of Technology. From 2002 – full professor (permanent position), Faculty of Chemical Engineering and Technology Zagreb University of Zagreb. Publishing: 55 papers in scientific journals. Active participation in over 120 international and domestic conferences. Recently scientific interested has been focused to environmental engineering specially in the field of organic dyes and chlorinated hydrocarbons concerning to cleaner processes of organic chemical industry. Leadership of Scientific Projects: “Wastewater of organic dye manufacturing and application”, 1992-1996; “Environmental Approach to Dyes and Pigments Production” 1996-2002; “Advanced Oxidation Processes for waste minimization of organic chemical industry, 2002-”. From 2000, co-leader of Croatian-American project, “An International Collaboration on Electrical Discharge Reactors for Degradation of Organic Dyes”. Other activities; 20 studies and projects for different chemical industries, also innovations and technological improvement in the field of organic dyes and pigments. From 1978-collaboration with University of Wales, Swansea, UK, ALIS foundation of British Council. 1999/2000 visiting professor at FAMU-FSU College of Engineering, Tallahassee, Florida, USA, Fulbright fellow.

**Date of last election**

12.12.2000.

**Referent publications of lecturer**

1. N.Koprivanac, A.Lončarić Božić, S.Papić, Cleaner Production Processes in the Synthesis of Blue Anthraquinone Reactive Dyes, *Dyes&Pigm.*, **44**, 33-40 (2000).
2. S.Papić, N.Koprivanac, A.Lončarić-Božić, Removal of Reactive Dyes from Wastewater using Fe(III) Coagulant, *Journal of the Society of Dyers and Colourists*, **116**, 352-358 (2000).
3. S.Papić, N.Koprivanac, A.Meteš, Optimizing Polymer-Included Flocculation Process to Remove Reactive Dyes from Wastewater, *Environmental Technology*, **21**, 97-105, (2000).
4. N.Koprivanac, A.Lončarić Božić, I. Peternel, D. Vujević, H. Kušić, Chlorinated Hydrocarbons Wastewater; Degradation Towards Minimization, *Environmental Management; Different Approaches, «Environmental Management – Contribution to Solutions»*, s 1. Međunarodnog simpozija o upravljanju okolišem, Zagreb, 1.-3. listopada 2003. *prihvaćeno za tisak*, (2004).
5. D.Vujević, N.Koprivanac, A.Lončarić Božić, R.B.Locke, The Removal of Direct Orange 39 by Pulsed Corona Discharge from model Wastewater, *Environmental Technology. prihvaćeno za tisak*, (2004)

**List of papers in last 5 years**

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2. A.Meteš, N.Koprivanac,A.Glasnović, Flocculation as a Treatment Method of Printing Ink Wastewater, *Water Environment Research*, 72, 6, 680-688 (2000).
3. S.Papić, N.Koprivanac, A.Lončarić-Božić, Removal of Reactive Dyes from Wastewater using Fe(III) Coagulant, *Journal of the Society of Dyers and Colourists*, 116, 352-358 (2000).
4. S.Papić, N.Koprivanac, A.Meteš, Optimizing polymer-included flocculation process to Remove Reactive dyes from wastewater, *Environmental Technology*, 21, 97-105, (2000).
5. S.Papić, N.Koprivanac, A.Lončarić Božić,A.Meteš, Removal of Some Reactive Dyes from Synthetic Wastewater by Combined Al(III) Coagulation/Carbon Adsorption Process, *Dyes and Pigments*, 62, 291-298 (2004).
6. A. Lončarić Božić, N. Koprivanac, P. Šunka, M. Člupek, V. Babicky, Organic Synthetic Dye Degradation by Modified Pinhole Discharge, *Czechoslovak Journal of Physics*. 54, 1-6 (2004).
7. N. Koprivanac, H. Kušić, D. Vujević, I. Peternel, B.R. Locke, Influence of Iron on Degradation of Organic Dyes in Corona, *Journal of Hazardous Materials*, 117, 113-119 (2004).
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10. S. Papić, N. Koprivanac, A.Lončarić Božić, D. Vujević, S. Kučar Dragičević, H. Kušić, I. Peternel, AOPs in Azo Dye Wastewater Treatment, *Water Environment Research*, u tisku (2005).

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**Course****CEMENT MATERIALS****Institution**

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**Curriculum vitae**

Born 09.05.1942. in Zagreb. B.S. Degree 1965., M.Sc. Degree 1969., Ph. D. 1974. Faculty of Technology, University of Zagreb. Job record: 1967.-1979. Assistant and Assistant Professor, 1979.-1988. Manager and Associate director «Chromos-Premazi», 1988.-1992. Assistant Professor and Associate Professor, 1993.- Full Professor Faculty of Chemical Engineering and Technology, Zagreb. Research record: 1975.-1976. postdoctoral study, University of Chicago, 1976.-1977. Research Associate, Northwestern University, 1977.-1978. Research Professor, Northwestern University, Chicago, USA, 1985. Bayer AG, Leverkusen and 1986. Bayer AG, Ürdingen, Germany. Scientific record: Ten new materials and products have been developed and commercially utilized. Three chapters in scientific books. Published more than sixty papers (twenty seven scientific papers in Journals and Proceedings CC cited). SCI: 112 citations. Two plenary and six public lectures in and outside the country. Principal investigator of twelve scientific projects. Sixteen feasibility studies conducted in different branches of industry.

**Date of last election**

02.02.1999.

**Referent publications of lecturer**

1. T. Matusinović and N. Vrbos, Alkali Metal Salts as Set Accelerators for High Alumina Cement, *Cem. Concr. Res.* 23 (1993) 177.
2. T. Matusinović and D. Čurlin, Lithium Salts as Set Accelerators for High Alumina Cement, *Cem. Concr. Res.*, 24 (1993) 885.
3. T. Matusinović, N. Vrbos and D. Čurlin, Lithium Salts in Rapid Setting High Alumina Cement Materials, *Ind. Eng.Chem. Res.*, 33 (1994) 2795.
4. T. Matusinović, J.Šipušić and N.Vrbos, Porosity-strength relation in calcium aluminate cement pastes, *Cem. Concr. Res.*, 33 (2003) 1801.
5. T. Matusinović, S. Kurajica and J. Šipušić, The Correlation between Compressive Strength and Ultrasonic Parameters of Calcium Aluminate Cement Materials, *Prihvaćeno za tisak u Cem. Concr. Res.* 34 (2004)1451.

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4. Matusinović, Tomislav; Šipušić, Juraj; Markučič, Damir; Stepanić, Josip. Analysis of Ultrasonic Impulse's Information Content in Characterisation of Cement Materials.

MATEST 2003, Zagreb 2003, Conference Proceedings 101-108.

5. Matusinović, Tomislav; Kurajica, Stanislav; Šipušić, Juraj. Thermal Analysis of Calcium Aluminate Cement Hydration Products. Nonmetal inorganic materials, manufacturing-processing- applications, Zenica 2004, BiH, Conference Proceedings 221-232.

#### ***Lecturer data***

***Surname, Name***

**PhD. Zlata Hrnjak-Murgić, associate professor**

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***Course***

**DEGRADATION AND RECYCLING OF PLASTIC WASTE**

***Institution***

Faculty of Chemical Engineering and Technology, Zagreb

#### ***Curriculum vitae***

Zlata Hrnjak Murgić was born 1958, in Karlovac, Croatia. Graduated in 1982 study of Chemical Technology, University of Zagreb Faculty of Technology, (B. Sc. Chem. Eng), master degree in 1988 at study of Chemical Engineering, University of Zagreb (M. Sc. Chem.) and in 1996 –doctor's degree, University of Zagreb Faculty of Chemical Engineering and Technology. Teaching and lecturing at undergraduate and at graduate study. *Research work*: published 20 scientific papers, gave 8 invited lectures, participated at 26 conferences. Active researcher at 9 scientific projects, tow International project ALIS LINK, 1997, and project leader of the project “Application of Coated PCC Nanofiller in Immiscible SAN/EPDM Blend” 2003. *Field of research interest*: characterization of cross-linked polymers, degradation of polymers, study of miscibility of blend polymers, synthesis of graft copolymers and recycling of polymers.

#### ***Date of last election***

21.06.2004.

#### ***Referent publications of lecturer***

1. J. Vugrinec, Lj. Kratofil, Z. Hrnjak-Murgić, J. Jelenčić, “Preparation of a New Polymeric Materials from Degradated SAN and EPDM Polymers”, *Mater. Res. Innov.* (2004.).
2. Z. Hrnjak- Murgić, L. Kratofil, Ž. Jelčić, J. Jelenčić, Z. Janović, “Reactive Extrusion of SAN/EPDM Blends”, *Int. Polym. Proc.* (2004.).
3. A. Ptiček, Ž. Petrinc, Z. Hrnjak-Murgić, J. Jelenčić, “Study of Optimal Conditions of In-situ Polymerization of Graft Copolymer EPDM-g-PS and Its Role in Polymer Blends”, *Matrib 2003*, Vela Luka, 2003. p. 215-221.
4. Z. Hrnjak – Murgić, G. P. Hellmann, J. Jelenčić, “Effect of Fraction and Type of Compatibilizer on Morphology of Polymer Blends PS/PC”, *Kem. u ind.* **51**(2002)1-6.

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3. Z. Hrnjak- Murgić, Lj. Kratofil, Ž. Jelčić, J. Jelenčić, Z. Janović, Reaktive Extrusion

- of SAN/EPDM Blends, *Int. Polym. Proc.*, 02 (2004)139-146.
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  5. Z. Hrnjak – Murđić, G. P. Hellmann, J. Jelenčić, Utjecaj udjela i vrste kompatibilizatora na morfologiju polimerne mješavine PS/PC, *Kem. u ind.* 51(2002)1-6.

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***Curriculum vitae***

Sanja Papić was born 1958 in Zagreb, received her chemical engineering diploma in 1983, M.Sc. diploma in 1989. and Ph.D in 1997., from University of Zagreb, Faculty of Chemical Engineerin and Technology. Presently assistant professor at the same faculty. Areas of research field are organic industrial processes, synthesis and characterization of dyes, clenaer production processes in the synthesis of dyes, environmental engineering, study of organic industry wastewater treatment processes including advanced technologies for water purification. Published 20 scientific articles ,participated at number of meetings and conferences, worked at 6 scientific projects, currently projects titled Advanced Oxidation Processes for Organic Chemical Industry Waste Minimization and An International Collaboration on Electrical Discharge Reactors for Degradation of Organic Dyes.

***Date of last election***

29.01.2001.

***Referent publications of lecturer***

1. Z. Grabarić, N. Koprivanac, S. Papić, Đ. Parac Osterman, H. Matanić, Synthesis, Application and Biodegradation of a Chromium Azomethine Dye, Dyes and Pigments 23 (1993) 255-265.
2. S. Papić, N. Koprivanac, A. Meteš, Optimizing Polymer-Induced Flocculation Process to Remove Reactive Dyes from Wastewater, Environmental Technology, 21 (2000) 97-105.
3. N. Koprivanac, A. Lončarić Božić, S. Papić, Cleaner Production Processes in the Synthesis of Blue Anthraquinone Reactive Dyes, 44 (2000) 33-40.
4. S.Papić, N.Koprivanac, A. Lončarić Božić, Removal of Reactive Dyes from Wastewater Using Fe(III) Coagulant, JSDC, 116 (2000) 352-358.
5. S.Papić, N. Koprivanac, A. Lončarić Božić, A.Meteš, Removal of Some Reactive Dyes from Synthetic Wastewater by Combined Al(III) Coagulation/Carbon Adsorption Process, Dyes and Pigments 62 (2004) 293-300.

***List of papers in last 5 years***

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5. A.Meteš, D.Kovačević, D.Vujević, S.Papić, The Role of Zeolites in Wastewater Treatment of Printing Inks, *Water Research*, 38, 3373-3381 (2004).
6. S.Papić, N.Koprivanac, A.Lončarić Božić, D.Vujević, S.Kučar Dragičević, H.Kušić, I.Peternel, AOPs in Azo Dye Wastewater Treatment, *Water Environment Research*, u tisku (2004).

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***Curriculum vitae***

Vesna Rek is professor at Faculty of Chemical Engineering and Technology, University of Zagreb. She is born in Zagreb. She obtained her B.Sc. degree (1965), M.Sc. degree (1972) and PhD degree (1997) from Faculty of Technology, University of Zagreb in the field of Chemical (Polymer) Engineering. Since 1965- 1967. she was working in industry. From 1967. she works at Faculty of Chemical Engineering and Technology, FKIT, in Department of Polymer Engineering and Organic Chemical Technology. From 1992. Vesna Rek is professor in technical science in the field of chemical engineering, fields of material and analysis and synthesis of processes. Her scientific work is connected with polymeric materials, with interrelation between structure and properties in production and processing, its stability and changes in ageing processes. She is teaching at ungraduated and graduated study at FKIT-u. She works as a head at Project supported by Ministry of Science of Croatia. She published over fifty scientific and professional papers. Vesna Rek took part at many international and domestic meetings and conference, with papers and invited paper and took part in many elaborates for industry. She was mentor of a great number diplomas works and many magistrate work and dissertations. She was a member of organising committee and scientific committee and leader of many meetings and conferences.

***Date of last election***

16.09.1997.

***Referent publications of lecturer***

1. Rek, V., Govorčin, E.: The morphological changes in segmented polyurethane under thermal tretment, Adv. Urethan. Sci. Tech., 11 (1992), 173.
2. Rek, V., Holjevac-Grgurić, T., Jelčić, Ž.: Effect of styrene-butadiene-styrene block copolymer on dynamic mechanical properties high-impact polystyrene, J.Macrom.Sci.Pure and Appl.Chem. A 35 (1998), 1385.
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4. Rek, V., Holjevac-Grgurić, T., Jelčić, Ž.: Rheological properties and morphology of high impact polystyrene and styrene/ethylene/buthylene/styrene blends, Materials Tribology Processing (2003) 223.
5. Rek, V., Holjevac-Grgurić, T., Jelčić, Ž.: Processing and Dynamic Mechanical Properties of PS-HI/SEBS Blends, Macromol. Symp. 202 (2003), 143.

***List of papers in last 5 years***

1. V. Rek, Vesna; Barjaktarović, Zrinka; Holjevac Grgurić, Tamara, The rheological properties of aged polymer bitumen, Natural and Artifical Ageing

Polymers/Reichert,Thomas(ur.).Pfinztal: Gesellschaft fur Umweltsimulation e V. GUS, 2004.

2. Govorčin Bajsić, Emi; Rek, Vesna, Dynamic mechanical study of thermoplastic polyurethane/polypropylene blends, *e-Polymers*, 073 (2004) 1-10.
3. Rek, Vesna, Holjevac Grgurić, Tamara, Jelčić, Želimir; Hace, Drago, Effect of styrene/ethylene/buthylene/styrene blockco polymer ondynamic mechanical behaviour and processability of high impact polystyrene,*e-Polymers*, 034(2004)1-13.
4. Govorčin Bajsić, Emi; Rek, Vesna; Agić, Ante, Thermal degradation of polyurethane elastomers: determination of kinetic parameters, *Journal of Elastomers and Plastic*, 35 (2003) 4, 311-323.
5. Rek, Vesna; Holjevac-Grgurić, Tamara; Jelčić, Želimir, Creep Relaxation and Stress Relaxation of PS-HI/SEBS Blends, *Macromolecular Symposia*, 202 (2003) 127-141.
6. Rek, Vesna; Holjevac-Grgurić, Tamara; Jelčić, Želimir, Processing and Dynamic Mechanical Properties of PS-HI/SEBS, *Macromolecular Symposia*, 202 (2003) 143-150.
7. Rek, Vesna; Barjaktarović, Zrinka, Dynamic Mechanical Behaviour of Polymer Modified Bitumen, *Material Research Innovation*, 6 (2002) 2, 39-43.
8. Govorčin Bajsić, Emi; Rek, Vesna, Thermal Stability of Polyurethane Elastomers Before and After UV Irradiation, *Journal of Applied Polymer Science*. 79 (2001.) 864-873.
9. Govorčin-Bajsić, Emi; Rek, Vesna; Sendijarević, Aiša; Sendijarević, Vahid; Frisch, Kurt, DSC Study of Morphological Changes in Segmented Polyurethane Elastomers, *Journal of Elastomers and Plastics*. 32 (2000.) 2; 162-182.
10. Rek, Vesna; Holjevac-Grgurić, Tamara; Jelčić, Želimir; Hace, Drago, Dynamic Mechanical Behaviour of Styrene/Butadiene Copolymers and their Blends, *Macromolecular Symposia*, *Polymer Characterization*,148 (1999.) 425-436.
11. Grgurić-Holjevac, Tamara; Rek, Vesna; Jelčić, Željko; Hace, Drago; Gomzi, Zoran, Determination of the Kinetic Parameters of the Thermal Oxidative Degradation of Styrene/Butadiene Copolymers, *Polymer Engineering & Science*. 39 (1999) 8; 1394-1397.
12. Jelčić, Željko,Grgurić-Holjevac, Tamara; Rek, Vesna, Mechanical Properties and FractalMorphology of HIPS/SBS Blends, *Polym. Degrad. Stab*. In press (2005).

**Lecturer data****Surname, Name****PhD. Katica Sertić-Bionda, associate professor****E-mail adress**

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**Course****ADVANCED PETROLEUM REFINERY PROCESSES****Institution**

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**Curriculum vitae**

Katica Sertić-Bionda was born 1951 in Brinje, received her Chemical Engineering diploma in 1976, M.Sc. diploma in 1985 and Ph.D in 1989., from University of Zagreb, Faculty of Technology (now Faculty of Chemical Engineering and Technology). She is presently associated professor at the same faculty. Her fields of research interest are : toluene hydrodealkylation, catalytic reforming, catalytic cracking, hydrodesulfurization, isomerization, production and application of gasoline and lubricating oil additives. Katica Sertić-Bionda published 36 scientific and professional articles, worked at six scientific projects, brought at number of meetings and conferences, supervisor of more than ten diploma students and one doctor student. She is a member of Scientific Committee of Petroleum, HAZU, Technical Committee for Petroleum Products and Lubricants, DZNM, Croatian Society for Fuels and Lubricants, Croatian Society of Chemical Engineers.

**Date of last election**

10.12.2001.

**Referent publications of lecturer**

1. K.Sertić-Bionda, Ž.Vrbanović, V.Rukavina, Naphtha Catalytic Reforming-Influence of Repeated Regeneration on the Catalytic Properties, Erdol Kohle, Erdgas Petrochem., 47(1994)234.
2. K.Sertić-Bionda, S.Zrnčević, Ž.Vrbanović, Kinetic of Naphtha Catalytic Reforming, Oil Gas, 22(2)(1996)35.
3. Z.Janović, K.Sarić, K.Sertić-Bionda, Polymerization and Polymer properties of Some Alkylmethacrylates as Lubricating Oil Viscosity Modifiers, Chm.Biochem.Eng.Q., 12(1998)19.
4. K.Sertić-Bionda, V.Kuzmić, M.Jednačak, The Influence of Process Parameters on Catalytic Cracking LPG Fraction Yield and Composition, Fuel Processing Technology 64(2000)107.
5. I.Lukec, K.Sertić-Bionda, i D.Lukec, Poboljšanje kvalitete motornih benzina modeliranjem procesa izomerizacije, Kem.ind., 52(10)(2003) 483.

**List of papers in last 5 years**

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2. K. Sertić-Bionda, M. Ištuk, V. Kuzmić: The Influence of the Catalyst Type on Catalytic Cracking Products Yield and Distribution, Nafta, 51(6) 235 (2000).
3. M. Zaić Kubatović, K. Sertić-Bionda: Utjecaj sirovine na svojstva bitumena, Zbornik radova 10. Ružičkini dani, Vukovar 2000, str.72-74.
4. D. Plavšić, N. Lerš, K. Sertić-Bionda: On the relation between W 'W index, hyper-

- Wiener index and Wiener number, *J. Chem. Inf. Comp. Sci.*, 40(3) 516 (2000).
5. V. Kuzmić, M. Ištuk, K. Sertić-Bionda: Utjecaj procesnih parametara na prinose i sastav produkata katalitičkog krekiranja, *Zbornik radova 10. Ružičkini dani*, Vukovar 2000, str. 61-63.
  6. K. Sertić-Bionda, M. Zaić Kubatović: Sensitivity of bitumen to temperature changes, *Nafta*, 52(10) 315 (2001).
  7. I. Lukec, K. Sertić-Bionda, D. Lukec: Modeliranje procesa izomerizacije u svrhu poboljšanja kakvoće motornih benzina, *Goriva i maziva*. 42(2) 75 (2003).
  8. I. Lukec, K. Sertić-Bionda, D. Lukec: Poboljšanje kvalitete motornih benzina modeliranjem procesa izomerizacije, *Kemija u industriji*, 52(10) 483 (2003).
  9. D. Draženović, K. Sertić-Bionda, V. Kuzmić: An Impact of Feedstock Properties in the Catalytic Cracking Process on the Content of Aromatic and Olefinic Hydrocarbons in Products: *Nafta*, 54(9) 325 (2003).
  10. K. Sertić-Bionda, T. Šarić, M. Mužić: Utjecaj procesnih varijabli na učinkovitost hidrodesulfurizacije plinskog ulja, *Goriva i maziva*. 42 (5) 343 (2003).
  11. M. Zaić Kubatović, K. Sertić-Bionda, Segedi, Božidar: Properties of bituminous mixtures containing polymer-modified bitumen, *Nafta*, 55(1) 25 (2004).
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  13. M. Zaić Kubatović, K. Sertić-Bionda: The penetration index as a measure of the bitumen temperature susceptibility, *Nafta*, 56(1) 39 (2005).
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**Curriculum vitae**

Jasenka Jelenčić was born 1946 in Zagreb, where in 1965 she completed secondary school, graduated 1969, master degree 1971, and doctor's degree in 1975 at Faculty of Technology, University of Zagreb, obtained at the same Faculty. After graduation she took a job on Faculty of Technology as assistant on Department of Polymer Engineering and Organic Chemical Technology and her positions are assistant professor from 1977, associated professor from 1982 and full professor from 1987.

She lectures the courses: Process of Polymerization and Nature and Synthetic Polymers on graduated study, and Modification of Polymeric Materials on postgraduate study.

The scientific interest of Jasenka Jelenčić is field of the polymeric materials, degradation and stabilization of polymers, including the processes of polymerization. She published more than sixty scientific papers.

From 1997 she was a vice dean of science and education, and from 2001 she is a dean of Faculty of Chemical Engineering and Technology University of Zagreb.

**Date of last election**

16.09.1997.

**Referent publications of lecturer**

1. Z.Hrnjak-Murgić, Z.Jelčić, V.Kovačević, M.Mlinac-Mišek, J.Jelenčić, Molecular and Morphological Characterization in Immiscible SAN/EPDM Blends Filled by Nano Filler, *Macromol. Mater.Eng.* 287 (2002)648.692.
2. J.Vugrinec, Lj. Kratofil, Z. Hrnjak-Murgić, J. Jelenčić, Preparation of New Polymer Material From Degradation SAN and EPDM Polymers, *Mater. Res. Innov.*(2004).
3. Z. Hrnjak – Murgić, G. P. Hellmann, J. Jelenčić, “Utjecaj udjela i vrste kompatibilizatora na morfologiju polimerne mješavine PS/PC”, *Kem. u ind.* 51(2002)1-6.
4. M.Bravar, J.Rolich, N.Ban, V.Gnjatović, Studies of Alcoholysis of Poly (Vinyl Acetate) to Poly(Vinyl Alcohol), *J. Polym. Sci. Symposia*, No 47(1974)329- 334.

**List of papers in last 5 years**

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3. B. Cerinski, J. Jelenčić, Modeling of High-Pressure Ethylene Polymerization. I. Kinetic Parameters of Oxygen Initiation, *J. Applied Polym. Sci.*, 83(2002) 2043-2051.
4. Z. Hrnjak – Murgić, G. P. Hellmann, J. Jelenčić, Utjecaj udjela i vrste kompatibilizatora na morfologiju polimerne mješavine PS/PC, *Kem. u ind.* 51(2002)1-6.
5. Z. Hrnjak- Murgić, Lj. Kratofil, Ž.Jelčić, J. Jelenčić, Z. Janović, Reaktive Extrusion of SAN/EPDM Blends, *Int. Polym. Proc.*, 02 (2004)139-146.

6. J. Vugrinec, Lj. Kratofil, Z.Hrnjak-Murgić, J. Jelenčić, New Materials from Degraded Styrene- acrylonitrile and Ethylene-propylene-diene Copolymers, e-Polymers, 035 (2004).

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Faculty of Chemical Engineering and Technology, Zagreb

***Curriculum vitae***

Born in Zagreb. 1971. B.Sc. Faculty of Technology, University of Zagreb, 1983 Ph.D. From 1971- working at Faculty of Technology, from 1988. Faculty of Chemical Engineering and Technology (FKIT), University of Zagreb. Professor from 1992. Specializations at Universities of Bath and Loughborough, UK. Foreign languages: English and German. The main fields of research interests are engineering of polymer materials, composites and blends, nanocomposites, surface engineering, aging and wearing of polymer materials. Published as author and co-author 98 papers; 57 scientific (37 CC cit.) and 41 profess. papers. Main researcher in 2 domestic- scientific and 2 foreign scientific projects. Mentor of several diploma. Magisterial and Ph.D. works. Involved with several subjects in under- and postgraduate education processes.

***Date of last election***

16.09.1997.

***Referent publications of lecturer***

1. V.Kovačević, S. Lučić, M. Leskovac, Morphology and Failure in Nanocomposites Part I: Structural and Mechanical Properties, *J.Adhes.Sci.Technol.*, 16(2002)1343- 365.
2. V.Kovačević, M. Leskovac, S. Lučić, Morphology and Failure in Nanocomposites Part II: Surface Investigation, *J. Adhes. Sci. Technol.*, 16, (2002) 1915-1929.
3. V.Kovačević, D.Packham, S.Lučić, D.Hace, I.Šmit, Composites of Poly(Vinyl Acetate) Filled with Calcium Carbonate; Microscopy, Diffractometry and Thermophysical Properties, *Polym.Eng.Sci.*, 39 (1998) 1433-1443.
4. V.Kovačević, S.Lučić, Ž.Cerovečki, Influence of Filler Pre-treatment on the Mechanical Properties of Composites, *Int.J.Adhes. Adhes.* 17 (1997) 239-245.
5. V.Kovačević, S.Lučić, D.Hace, A.Glasnović, Rheology and Morphology of Poly(Vinyl Acetate) Calcite Films, *Polym.Eng.Sci.*, 36 (1996) 1134-1139.

***List of papers in last 5 years***

1. S.Lučić, V.Kovačević, D.E. Packham, A. Bogner, A.Geržina, Stearate-modified Calcium Carbonate Fillers and their Effect on the Properties of Poly(vinyl acetate) Composites, Ed.K.L.Mittal, *Polymer Surface Modification: Relevance to Adhesion*, Vol.2, VSP, Utrecht, 2000, p.505-525.
2. V.Kovačević, S.Lučić-Blagojević, M.Leskovac, Filler –Matrix Adhesion, *Handbook of Adhesion*, 2nd Edition, Ed. D.E. Packham, John Wiley & Sons, West Sussex, UK, 2005.
3. Z.Hrnjak-Murgić, Ž.Jelčić, V.Kovačević, M.Mlinac-Mišak, J.Jelenčić, Molecular and Morphological Characterisation of Immiscible SAN/EPDM Blends Filled by Nano Filler, *Macromol.Mater.Eng.*, 287 (2002) 684-692.

4. M.Leskovac, V.Kovačević, S.Lučić, H.R.Perott, I.Šmit, Composites of Poly(acrylate) Copolymer Filled with Diatomic Earth; Morphology and Mechanical Behavior, *Mat.Res.Innov.*, 6 (2002) 206-213.
5. V.Kovačević, S. Lučić, M. Leskovac, Morphology and Failure in Nanocomposites Part I: Structural and Mechanical Properties, *J. Adhes. Sci. Technol.*, 16 (2002) 1343-1365.
6. V.Kovačević, M. Leskovac, S. Lučić, Morphology and Failure in Nanocomposites Part II: Surface Investigation, *J. Adhes. Sci. Technol.*, 16, 2002, 1915-1929.
7. M. Leskovac, V. Kovačević, Sanja Lučić-Blagojević, Domagoj Vrsaljko, Vesna Volovšek, Pretreatment of CaCO<sub>3</sub> Nanofiller by Irradiation Method in a Presence of Vinyl Monomers for PVAc Composites, *e-Polymers*, no. 033 (2004), 1-13, <http://www.e-polymers.org>, ISSN 1618-7229.
8. S. Lučić-Blagojević, V. Kovačević, M. Leskovac, D. Vrsaljko, V. Volovšek, Ch. Nover, Silane Pre- treatment of Calcium Carbonate Nanofillers for PU Composites, *e-Polymers*, no. 036 (2004), 1-14, <http://www.e-polymers.org>, ISSN 1618-7229.
9. V.Kovačević, M.Leskovac, S.Lučić-Blagojević, D. Vrsaljko, Complex Adhesion Effects of Inorganic Nanofillers vs Microfillers in Polymer Composites, *Macromolecular Symposia*, Wiley-VCH, Weinheim, Germany (2005).
10. S. Lučić Blagojević, V. Kovačević, M. Leskovac, D. Vrsaljko, Nanokompozitni polimerni materijali i adhezija, *Kemija u industriji*, 54 (2005) 1-9.

**Lecturer data****Surname, Name****PhD. Mirela Leskovac, associate professor****E-mail adress**

mlesko@fkit.hr

**Course****ADHESIVE PROCESSES AND MATERIALS****Institution**

Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Born in Zagreb. 1988. B.Sc. Faculty of Technology, University of Zagreb, 2000. Ph.D. at Faculty of Chemical Engineering and Technology University of Zagreb. From 1990- working at Faculty of Chemical Engineering and Technology (FKIT), University of Zagreb. Docent from 1993. Specializations at Universities of Bath, UK. Foreign language: English. The main fields of research interests are chemical engineering, engineering of polymer materials (copolymers and composite polymer systems, kinetics of degradation), surface engineering (adhesion, interphase in composites). Published as author and co-author 9 scientific papers; involved in 12 international and 10 domestic scientific conferences. The winner of reward for the representing the paper at Intern. Conf. on Polym. Charact. North Texas, 1995.

**Date of last election**

16.06.2003.

**Referent publications of lecturer**

1. M.Leskovac, V.Kovačević, S.Lučić, H.R.Perott, I.Šmit, Composites of Poly(acrylate) Copolymer Filled with Diatomic Earth; Morphology and Mechanical Behavior, *Mat.Res.Innov.*, 6 (2002) 206-213.
2. Leskovac, V. Kovačević, D. Fleš, D. Hace, Thermal Stability of Poly(Methyl Methacrylate-co-Butyl Acrylate) and Poly(Styrene-co-Butyl Acrylate) Polymers, *Polym. Eng. Sci.*, 39(1999) 600-608.
3. M.Leskovac, V.Kovačević, D.Stanojević, M.Bravar, Correlation Between Mechanical Properties and Degradation Processes of Poly (Methyl- Methacrylate-co-Butyl Acrylate) Films, *J. Appl. Polym. Sci.* 53 (1994) 1717-1721.
4. V.Kovačević, M. Leskovac, S. Lučić, Morphology and Failure in Nanocomposites Part II: Surface Investigation, *J. Adhes. Sci. Technol.*, 16, 2002, 1915-1929.
5. M. Leskovac, V. Kovačević, Sanja Lučić-Blagojević, Domagoj Vrsaljko, Vesna Volovšek, Pretreatment of CaCO<sub>3</sub> Nanofiller by Irradiation Method in a Presence of Vinyl Monomers for PVAc Composites, *Mat.Res.Innov.* (2004) (in press).

**List of papers in last 5 years**

1. M.Leskovac, V.Kovačević, S.Lučić, H.R.Perott, I.Šmit, Composites of Poly(acrylate) Copolymer Filled with Diatomic Earth; Morphology and Mechanical Behavior, *Mat.Res.Innov.*, 6 (2002) 206-213.
2. V.Kovačević, S. Lučić, M. Leskovac, Morphology and Failure in Nanocomposites Part I: Structural and Mechanical Properties, *J. Adhes. Sci. Technol.*, 16(2002) 1343-1365.
3. V.Kovačević, M. Leskovac, S. Lučić, Morphology and Failure in Nanocomposites Part II: Surface Investigation, *J. Adhes. Sci. Technol.*, 16, 2002, 1915-1929.

4. M. Leskovic, V. Kovačević, Sanja Lučić-Blagojević, Domagoj Vrsaljko, Vesna Volovšek, Pretreatment of CaCO<sub>3</sub> Nanofiller by Irradiation Method in a Presence of Vinyl Monomers for PVAc Composites, *e-Polymers*, no. 033(2004), 1-13, <http://www.e-polymers.org>, ISSN 1618-7229.
5. S. Lučić-Blagojević, V. Kovačević, M. Leskovic, D. Vrsaljko, V. Volovšek, Ch. Nover, Silane Pre- treatment of Calcium Carbonate Nanofillers for PU Composites, *e-Polymers*, no. 036 (2004), 1-14, <http://www.e-polymers.org>, ISSN 1618-7229.
6. V.Kovačević, M.Leskovic, S.Lučić-Blagojević, D. Vrsaljko, Complex Adhesion Effects of Inorganic Nanofillers vs Microfillers in Polymer Composites, *Macromolecular Symposia*, Wiley-VCH, Weinheim, Germany (2005).
7. V.Kovačević, S.Lučić-Blagojević, M.Leskovic, Filler Matrix Adhesion, *Handbook of Adhesion*, 2nd Edition, Ed. D.E. Packham, John Wiley. Sons, West Sussex, UK, 2005.
8. S. Lučić Blagojević, V. Kovačević, M. Leskovic, D. Vrsaljko, Nanokompozitni polimerni materijali i adhezija, *Kemija u industriji*, 54 (2005) 1-9.

**Lecturer data****Surname, Name****PhD.Ema Stupnišek-Lisac, full professor****E-mail adress**

elisac@fkit.hr

**Course****METAL CORROSION INHIBITORS****Institution**

Faculty of Chemical Engineering and Technology, Zagreb

**Curriculum vitae**

Ema Stupnišek-Lisac, was born in Zenica 1943. She completed Secondary school in Zagreb 1962. In the year 1967. she graduated on Faculty of Technology, University of Zagreb, obtained her Master degree in 1972. at Faculty of Technology, University of Zagreb and Doktor's degree 1975. at the same Faculty.

In the academic year 1973/74 Ema Stupnišek-Lisac was on specialisation in Laboratoire Physique des Liquides et Electrochimie, Universite Pierre et Marie Curie, Paris, France.

In the 1968. she took a job as assistant in Institute of Physical Chemistry, University of Zagreb.

From 1976. she works as assistant, assistant professor, associated professor and full professor at the Faculty of Chemical Engineering and Technology University of Zagreb. From 2001. she is Vice-Dean for Education and Recherche at the Faculty of Chemical Engineering and Technology, University of Zagreb.

The field of her research is corrosion and corrosion protection of metals. The main research activities are dedicated to protection of metals from corrosion in very aggressive solutions by addition of non-toxic corrosion inhibitors. She published more than 50 scientific papers.

**Date of last election**

18.11.2003.

**Referent publications of lecturer**

1. Stupnišek-Lisac, E., Galić, Nevenka., Gašparac, R. Corrosion inhibition of copper in hydrochloric acid under flow conditions, *Corrosion*, 56 (2000), 1105-1112.
2. Gašparac, R., Martin, C. R., Stupnišek-Lisac, E., Mandić, Z. In-situ and Ex-situ Studies of Imidazole and its Derivatives as Copper Corrosion Inhibitors. Part II. AC Impedance, XPS and SIMS Studies. *J. Electrochem. Soc.*, 147 (2000) 991-998.
3. Stupnišek-Lisac, E., Lisica, M., Reichenbach, D., Copper Corrosion Inhibition In Printed Circuit Board Production Plating and Surface Finishing, 88(2001)90-92.
4. Stupnišek-Lisac, E., Gazivoda, A., Madžarac, M., Evaluation of non-toxic corrosion inhibitors for copper in sulphuric acid *Electrochimica Acta.*, 47 (2002) 4189-4194.
5. Otmačić, H. Stupnišek-Lisac, E. Copper corrosion inhibitors in near neutral media, *Electrochimica Acta*, 48(2003) 985-991.

**List of papers in last 5 years**

1. Stupnišek-Lisac, E., Brnada A., Mance A. D., Secondary Amines as Copper Corrosion Inhibitors in Acid Media *Corr. Sci.*, 42(2000) 243-257.
2. Gašparac, R., Martin, C. R., Stupnišek-Lisac, E. In-situ Studies of Imidazole and its Derivatives as Copper Corrosion Inhibitors. *J. Electrochem. Soc.* 147 (2000) 548-551.
3. Gašparac, R., Martin, C. R., Stupnišek-Lisac, E., Mandić, Z. In-situ and Ex-situ Studies

- of Imidazole and its Derivatives as Copper Corrosion Inhibitors. *J. Electrochem. Soc.*, 147 (2000) 991-998.
4. Stupnišek-Lisac, E., Galić, Nevenka., Gašparac, R. Corrosion inhibition of copper in hydrochloric acid under flow conditions *Corrosion*, 56 (2000), 1105-1112.
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  7. Stupnišek-Lisac, E., Gazivoda, A., Madžarac, M., Evaluation of non-toxic corrosion inhibitors for copper in sulphuric acid *Electrochimica Acta.*, 47 (2002) 4189-4194.
  8. Otmačić, H., Telegdi, J., Papp K. and Stupnišek-Lisac, E. Protective properties of an inhibitor layer formed on copper in neutral chloride solution *J. Appl. Electrochem.*, 34 (2004) 545-550.
  9. Gašparac, R., Stupnišek-Lisac, E., Martin, Ch. Imidazole and its Derivatives as Inhibitors for Prevention of Corrosion of Copper The European Federation of Corrosion, IOM Communications, London, 2000, pp. 20-36.
  10. Stupnišek-Lisac, E., Gazivoda, A., Madžarac, M. Nontoxic Corrosion Inhibitors for Copper in Sulphuric Acid The Electrochemical Society, Inc., Pennington, USA 2001. pp. 493-500.
  11. Cajner, F., Landek D., Stupnišek-Lisac, E. Improvement of properties of steels applying salth bath nitrocarburizing with post oxidation *Materials and Technology*, 37 (2003) 333-339.
  12. Stupnišek-Lisac, E., Živković, S., Gašparac, R. Effect of Flow on Corrosion Inhibition of Copper in Acid Media on Corrosion Inhibitors, Proceedings 9 SEIC Ferrara, Italy, 2000, (567-578).
  13. Otmačić, H., Stupnišek-Lisac, E. Copper Corrosion Inhibitors in Near Neutral Media Congress Proceedings Eurocorr 2001, Milano, Italy, 2001 (1-10).
  14. Stupnišek-Lisac, E., Otmačić, H., Gorščak, M. The Influence of pH on the Copper Corrosion Inhibition in Chloride Media Congress Proceedings 15th International Corrosion Congress, Madrid, Španjolska 2002., 1-7.
  15. Otmačić, H., Stupnišek-Lisac, E., Imidazole Derivatives as Copper Corrosion Inhibitors Congress Proceedings 15th International Corrosion Congress, Madrid, Španjolska, 2002., 1-7.
  16. Otmačić, H., Brezonjić, R., Milojević, A., Stupnišek-Lisac, E. Investigation of Corrosion Inhibitor Performance on Rotating Disc Electrode Congress Proceedings Eurocorr 2003., Budapest, Hungary, 2003, 1-9.
  17. Stupnišek-Lisac, E., Gazivoda, A., Madžarac, M., Nontoxic Corrosion Inhibitors for Copper in Sulphuric Acid. *Corrosion and Corrosion Protection*, edited by Sinclair, J.D.; Frankenthal, R.P.; Kalman E.; Plieth, W., The Electrochemical Society, Inc., Pennington, USA 2001. pp. 493-500.
  18. Stupnišek-Lisac, E., Otmačić, H. Copper Corrosion Inhibitors. *Zbornik radova 3. hrvatskog simpozija o elektrokemiji*, Dubrovnik, 2004, 45-48.

**Lecturer data****Surname, Name****PhD. Tine Koloini, full professor****E-mail adress**

tine.koloini@uni-lj.si

**Course****APPLIED TRANSPORT PHENOMENA****Institution**

Faculty of Chem. and Chem. Technology, Ljubljana, Slovenia

**Curriculum vitae**

Born in Plače, Slovenia, 19.2.1940. Academic experience: Assistant 1964, assistant professor 1975, associate professor 1980, full professor 1985 -. Head of Department of Chemistry and Chemical Technology 1993, dean of Faculty of Chemistry and Chemical Technology 1997-2001. Consultant in KRKA – Pharmaceutical and Biochemical Industries 1980 – 1995., in BELINKA, Chemical Industries 1988 – 1992, CINKARNA – Chemical Industries 1988 – 1992, HIDROINŽINIRING – Consultants 1985 – 1990. Research interests: Applied transport phenomena in chemical and biochemical reactors, ion exchange, reactor design. Practical achievement: Industrial process for recycling of borates by ion exchange technology (BELINKA), optimization of the large scale fermentation plants (KRKA), industrial process for the improved Cu-fungicides (CINKARNA). Membership: EFChE Working Party on Environmental Protection. Bibliography: ~ 80 scientific and other papers in the national and international journals and conference proceedings. Book: Prenos toplote in snovi, FKKT, 1999.

**Date of last election****Referent publications of lecturer**

1. I. Mihelič, A. Podgornik, T. Koloini, Temperature influence on the dynamic binding capacity of a monolithic ion-exchange column, *J. Chromatogr. A* 987 (1-2):159-168 Feb.14.2003.
2. I. Mihelič, T. Koloini, A. Podgornik, Temperature distribution effects during polymerization of methacrylate-based monoliths, *J. Appl. Polym. Sci.* 87 (14) 2003, 2326-2334.
3. A. Podgornik, M. Barut, A. Strančar, Đ. Josić, T. Koloini, Construction of large volume monolithic columns, *Anal. Chem.*; 72 (22) 2000, 5693-5699.
4. G. Pipus, I. Plazl, T. Koloini, Esterification of benzoic acid in microwave tubular flow reactor, *Chem. Eng. J.*; 76 (3) 2000, 239-245.
5. I. Mihelič, T. Koloini, A. Podgornik et al., Dynamic capacity studies of CIM (Convective Interaction Media) ® monolithic columns, *HRC-J-High Res, Chrom.*; 23 (1) 2000, 39-43.

**Lecturer data****Surname, Name****PhD. Željko Knez, full professor****E-mail adress**

zeljko.knez@uni-mb.si

**Course****HIGH-PRESSURE PROCESS TECHNOLOGIES****Institution**

Fakultet za kemijo in kemijsko tehnologijo, Univerze v Maribor

**Curriculum vitae**

*Affiliation and official address:* Faculty of Chemistry and Chemical Engineering University of Maribor, Smetanova 17, 2000 Maribor, Slovenia. *Education:* B. Sc.- 1977 University of Maribor, Slovenia, M. Sc.- 1979 University of Ljubljana, Slovenia, Ph. D.- 1984 University of Maribor, Slovenia. *Career / Employment:* 1977-1981 Pinus - Chemical Works, Maribor, Slovenia, 1981-1983 Assistant lecturer in Separation Processes, Department of Chemical Engineering, Faculty of Technical Sciences Maribor, 1985- Formation of Laboratory for Separation Processes, 1989-1995 Associate Professor. Since 1995 Full Professor. 1996- Formation of Pilot Plant Laboratory in Technology park 1997-2000 Vice dean for research. Since 1999 European Federation of Chemical Engineering, Executive board - Frankfurt, Germany. Since 1999-GVC-VDI "Hochdruck Verfahrenstechnik"-Germany. 1999-2002, Vice Rector for research. 2002-2003, Executive Rector. Since 2003 Vice Rector for research. Since 2003 Chairman of WP High Pressure Technology. *Stays abroad:* 1985 - 5 months-Department of Food Engineering, Agricultural University, Wageningen, The Netherlands (Prof. K. van Riet), 1 month in years: 1990/92/94/95/96/97 Technische Chemie II, UNI Erlangen, Nurnberg (Prof.Dr.Ing. R. Steiner). *Research Interest:* High Pressure technologies, phase equilibria with SC fluids, mass transfer in the system with SC fluids, high pressure micronisation processes, enzymatic reactions in SC fluids. *Publications:* articles refereed journal 41, chaptres to 10 books (Elsevier, Blackie Academic), patents and patent applications 25 (EU, CAN, JAP,USA, PCT 4X), conferences:over 200. *Industrial projects:* Several industrial projects in chemical, food, cosmetics and pharmaceutical industry (national, USA and EU). *International scientific projects:* Germany-Slovenia, France-Slovenia, UK-Slovenia, Greece- Slovenia, Bavaria-Slovenia, COST D10, D29, D30, CEEPUS.A-19, EU project 5<sup>th</sup> framework-PRONUTRA, EU project 5<sup>th</sup> framework-Marie Curie Training site. *Membership in scientific associations:* European Federation of Chemical Engineering (WP high pressure Technologies) –Frankfurt, Germany, European Federation of Chemical Engineering-executive board, GVC-VDI f.a. "Hochdruck Verfahrenstechnik", American Oil Chemists Society -Washington, USA, ISASF (International Society fo Advancement of Supercritical Fluids) - Nancy, France, Slovenian chemical Society -Ljubljana, Slovenia, Editorial Board Member of Acta Chimica Slovenica..*Referee for:* J. Chem. of Chem. Eng. Data, J. Supercritical Fluids, Fluid Phase Equilibria, Industrial and Engineering Chemistry Research, Transactions of the Institution of Chemical Engineers, London, Chemical and Biochemical Engineering Quaterly, Zagreb, Journal of Agricultural and Food Chemistry, Washington.

**Date of last election**

1995.

**Referent publications of lecturer**

1. Knez Z, Weidner E, Particles formation and particle design using supercritical fluids, *Current Opinion Solid State Materials Science*, 7 (4-5): 353-361, AUG-OCT 2003.
2. Weidner E, Petermann M, Knez Z, Multifunctional composites by high-pressure spray processes, *Current Opinion Solid State Materials Science*, 7 (4-5): 385-390, AUG-OCT 2003.
3. Knez Z, Habulin M, Primožic M, Hydrolases in supercritical CO<sub>2</sub> and their use in a high-pressure membrane reactor, *Bioproc Biosyst Eng*, 25 (5): 279-284, MAR 2003.
4. Skerget M, Novak-Pintaric Z, Knez Z, et al., Estimation of solid solubilities in supercritical carbon dioxide: Peng-Robinson adjustable binary parameters in the near critical region, *Fluid Phase Equilib*, 203 (1-2): 111-132, DEC 1 2002 .
5. Knez Z, Habulin M, Compressed gases as alternative enzymatic-reaction solvents: a short review, *J. Supercrit Fluid*, 23 (1): 29-42, MAY 2002.

**Lecturer data****Surname, Name****PhD. Ivan Perić, associate professor****E-mail adress**

iperic@pbf.hr

**Course****PARTIAL DIFFERENTIAL EQUATION****Institution**

Faculty of Food Technology and Biotechnology, Zagreb

**Curriculum vitae**

I was born on 4.9.1955. in Zagreb. I got my Ph.D. 1997. on PMF-Mathematics Department. I was elected associate professor in 2004. Until 1991. I worked as assistant and lecturer at Mathematics Department of Technical Military Academy in Zagreb. From 1992. till 2000. I worked as assistant and assistant professor at Faculty of Chemical Engineering and Technology in Zagreb. From 2000. I have been working at Faculty of Food Technology and Biotechnology.

I have so far published 19 scientific papers in international journals, 9 of which are CC journals. I'm one of the co-mentors of Seminar for Inequalities and Applications at PMF-Mathematics Department, and also one of the researchers on scientific project Bounds for functionals on function spaces mentored by prof. Sanja Varošaneć.

**Date of last election**

31.03.2004.

**Referent publications of lecturer**

:

1. I. Perić, D. Žubrinić, Caccioppoli's Inequality for Quasilinear Elliptic Operators, *Mathematical Inequalities and Applications* 2(1999)251-261.
2. A. Čižmešija, J. Pečarić, I. Perić, Mixed means and inequalities of Hardy and Levin-Cochran-Lee type for multidimensional balls, *Proceedings of American Mathematical Society* 128(2000)2543-2552.
3. J. Pečarić, I. Perić, R. Roki, On bounds for weighted norms for matrices and integral operators, *Linear Algebra and its Applications* 326(2001)121-135.
4. J. Pečarić, I. Perić, L.-E. Persson, A sharp multidimensional Bergh type inequality, *Mathematische Nachrichten* 228(2001)155-162.
5. A. Čižmešija, I. Perić, Mixed means over balls and annuli and lower bounds for operator norms of maximal functions, *Journal of Mathematical Analysis and Applications* 291(2004)625-637.

#### **II.4.7. The list of teaching places**

See the item II.4.2.

#### **II.4.8. Optimal number of students**

Optimal number of students concerning the space, equipment and number of lecturers is between 30 and 50 maximal.

#### **II. 4.9. Costs evaluation of the doctoral Study**

The costs for studying the doctoral program is 42.000,00 kn total.

#### **II. 4.10. Financing of the doctoral study**

The doctoral programs are financed exclusively by the school fee of the students. They either pay by themselves or they get paid by the institution in which they work. If the students are junior researchers, the school fee is partly refunded by the Ministry of science, education and sports with the support of scientific projects, which they are scientific active on.

#### **II. 4.11. Quality of the doctoral study**

During the study the students evaluate the quality and the successfulness of the doctoral study via students' anonymous polls. In the same way, by means of polls, they monitor the improving of the doctoral study and the Faculty only performs the evaluation process of the mentioned study.