Technion – Israel Institute of Technology

The Wolfson Department of Chemical Engineering

Graduate Study Manual
October 2021

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1. General

The graduate studies aim to deepen and expand basic knowledge in Chemical Engineering, as well as to develop an increased ability to handle complex problems in the various fields of Chemical Engineering. The research and the teaching curriculum cover a wide range of topics including: transport phenomena, fluid flow, actions foundation in chemical engineering, separation processes, water desalination, petroleum, development, operation and control process control engineering, reactors, adsorption and catalysis, engineering polymers and plastics, and biomedical engineering – Chemical and Bio – medical, Biophysics, environmental engineering, micro-structure and nanotechnology, particle systems, colloidal systems, complex fluids, space effects, processing and ceramic materials – lead, and the study of crystal growth processes in thin layers.

The Master and PhD programs include classes and lab-work. The studies are part of an extensive work within the faculty, ranging from basic scientific research to applicable research and development. The basic research contributes in expanding and enriching the knowledge in the various fields of Chemical Engineering and its adjacent sciences. The applicable research aims to meet the needs of the chemical, biochemical and micro-electronic industries in the present and future, and to introduce new and innovative approaches and advance concepts.

2. Masters Programs

There are three Masters Programs available towards a degree:

Master of Science in Chemical Engineering (MSc with a thesis)

A program which includes research thesis, and is intended for Chemical Engineering BSc graduates or Exact Sciences graduates (with requirement for complementary courses; see ahead).

Master of Science (MSc with a thesis)

A program which includes research and a thesis. The program is intended for students without a background in chemical engineering who wish to conduct their research in one of the faculty's research groups.

Master of Engineering in Chemical Engineering (ME without a thesis)

A program which includes courses without a research paper or thesis, but with a research project course. This program is especially suitable for industry personnel.

A. Master of Science in Chemical Engineering (MSc)

Admission

- The faculty will discuss candidates with undergraduate study average of 83 and above. The undergraduate study average is the base for discussion at the graduate study committee and is not a guaranty for acceptance. Candidates with average lower than the acceptance criteria (but not lower the 82) will be considered in unusual cases.
- The success percentage in the undergraduate studies, relative ranking in the class and recommendations will be included in the graduate study committee decision. Candidates will be interviewed according to their academic background. Each case will be discusses separately.
- Candidates, which does not meet the faculty acceptance criteria, but meet the graduate school acceptance criteria, can apply if they have obtained working experience over three years. Such requests will be considered according to the recommendations and their skills and professional achievements.
- Candidates are required to find a research advisor as a condition for admission.
- Candidates must submit at least two recommendations with their application forms, and a document attesting to their relative ranking within their class.
- Candidates that have completed a three-year degree, will be accepted as complementary students and will be required to complete 20 points of undergraduate courses. The list of courses will be determined for each student individually based on his/her background.
- Undergraduates can enroll in the program for Bachelor's and Master's degree, if their average is at least 90 and they have less than 10 points left to complete their Bachelor's degree.

Academic requirements

- Each student will complete a total of 36 academic points, consisting of 16 points in graduate courses and 20 academic points for the research thesis.
- Students in this lane must study at least seven courses *, of which at least four are from the Chemical Engineering faculty, including three mandatory courses: "Mathematical Methods in Chemical Eng." (058177), must be studied during the first year of studying, and two core courses from the core courses list (see below). The remaining academic points can be accumulated by taking courses offered by other faculties, with the approval of the research advisor.
- Students are required to complete an experimental or theoretical research thesis. The goal of the research work is to allow the student to learn and gain experience in research, in the framework of one of the department's research groups.
- Every student must meet the foreign language requirement as defined by the Graduate School.

* Does not include the course "Chemical Engineering Seminar" (058176)

B. Master of Science (MSc)

Admission

- This lane is designed for students holding a BSc in any field other than Chemical Engineering.
- The faculty will discuss candidates with undergraduate study average of 83 and above. The undergraduate study average is the base for discussion at the graduate study committee and is not a guaranty for acceptance. Candidates with average lower than the acceptance criteria (but not lower the 82) will be considered in unusual cases.
- The success percentage in the undergraduate studies, relative ranking in the class and recommendations will be included in the graduate study committee decision. Candidates will be interviewed according to their academic background. Each case will be discusses separately.
- Candidates, which does not meet the faculty acceptance criteria, but meet the graduate school acceptance criteria, can apply if they have obtained working experience over three years. Such requests will be considered according to the recommendations and their skills and professional achievements.
- Every candidate will be required to find a supervisor for research, as a condition for admission.
- Candidates must submit at least two recommendations with their application forms, and a document attesting to their relative ranking within their class.
- Candidates who completed a four-year engineering degree will usually not be required to complete prerequisite courses.
- Candidates who completed a three-year degree will usually be required to complete prerequisite courses, a total of 20 points, consisting of undergraduate courses (10 credits at least) and graduate courses. The list of courses will be determined for each student individually according to their previous academic background.

Academic requirements

- Each student in this lane will gain a total of 36 academic points consisting of 16 points in graduate courses (at least seven courses) and 20 academic points for the research thesis. The courses will be determined on an individual basis, depending on the student's background and research topic. At least three of the seven courses will be of the "advanced" level (..8…). The course plan will be decided together with the research advisor and requires approval of the Graduate Studies Committee.
- Every student must meet the foreign language requirement as defined by the Graduate School.

C. Master of Engineering in Chemical Engineering (ME)

Admission

- Master of Engineering in Chemical Engineering is intended for students holding a BSc in Chemical Engineering, with an average of at least 80. With their grades, the candidates are requested to submit a document attesting to their relative ranking within their class.
- This lane is also open to students with a BSc in fields other than Chemical Engineering who meet the requirements for Graduate School. Such candidates will be required to complete prerequisite courses.
- Candidates will be interviewed in order to assess their background level of knowledge and suitability for the program.
- Every candidate must submit at least two recommendations with their application forms.
- Students may switch from ME to MSc during their studies, according to the protocol of the faculty and the Graduate School.

Academic requirements

Studying courses with a total of at least 40 points, according to the following details:

- 2 Mandatory Courses
    1. 058177- Mathematical Methods in Chemical Eng. 3.5 points
    2. 058174- Advanced Seminar in Chemical Engineering 6.0 points

    The seminar will include independent work such as an advanced seminar paper, lab or project, and will include submission of a written paper. This paper may be a small-scale lab research, an engineering design project, a literature review etc.

- At least one course from the Chemical Engineering list of core courses (see below).
- At least 17 academic points (not including the final project course) from the Chemical Engineering department.
- Advanced courses in Chemical Engineering or other departments to complete the required total number of points. The choice of courses require approval of the Graduate Studies Committee. Among these, up to five management courses can be selected.
- All students must complete foreign language requirement in accordance with the requirements of the Graduate School.

Change Lane from ME to MSc

Students for ME can switch to MSc (which includes research thesis), after meeting the following requirements:

1. A student who graduated with at least 83 in Chemical Engineering, will be allowed to switch to research track after completing at least one semester of ME studies, provided his ME average is over 85, with a minimum of 80 in each course.
2. A student who graduated with an average lower than 83 in Chemical Engineering will be allowed to switch to research track after completing at least one semester in ME studies with an average grade of at least 85, with a minimum of 80 in each course, and after completing one core course and "Mathematical Methods in Chemical Eng." course, or alternatively two core courses.
3. If the student does not have a BSc form the Chemical Engineering faculty, he will additionally be interviewed for acceptance.
4. According to the Graduate School requirements, the student will have to submit a research proposal, as well as to pass the "Research Ethics" exam.

3. Graduate Study Course List

A. Master of Science in Chemical Engineering (MSc) Lane

1. Mathematical Course (Mandatory)

058177- Mathematical Methods in Chemical Eng. (3.5 points)

2. Core courses (at least two courses out of the core courses list)

058127- Transport Phenomena - Fluid Flow	2.5 points
Or	
036086- Flow and Transport in Microdevices	3.0 points
058143-Transport Phenomena Heat and Mass	2.5 points
058144- Advanced Chemical Engineering Thermodynamics	2.5 points
Or	
058186- Statistical Thermodynamics in Chem. Eng.	2.5 points
058145- Advanced Reactor Design	2.5 points
058185- Solid State in Chemical Engineering Grad	2.5 points
116029- Introduction to Biophysics	3.5 points
096414-Industrial Statistics	3.5 points
138018- Proteomics	3.0 points

3. Elective Courses

056383- Complex Fluids	2.0 points
056166- Interfacial Phenomena	2.0 points
056396- Particulate Fluids	2.5 points
058172- Polymer Thermodynamics	2.0 points
058173- Physical Methods for Polymer Characterization	2.0 points
058183- Polymers in Biotechnology	2.0 points
058184- Polymer Characterization Laboratory	2.0 points
058162- Polymer Processing	2.0 points
056391- Sensors Based on Nano (Bio) Materials	2.5 points
056394- Odor Fingerprints	2.0 points

056388- Introduction to Molecular Simulations	2.0 points
058182- Dynamical Systems in Life Science	2.5 points
056120- Electron Microscopy in Chemical Eng.	2.0 points
056379- Membrane Processes Laboratory	2.0 points
056146- Selected Engineering Subjects	2.0 points
058160- Advanced Topics	2.0 points
056386- Selected Engineering Issues 2	2.0 points
056399- Engineering for Energy and Environment	2.0 points
056400- Process Safety in Chemical Engineering	2.0 points
056398- Catalysis on Surfaces	2.0 points
056397- Membranes Principles and Materials	2.5 points
056178- Approximate Methods in Chemical Eng.	2.0 points
056149- Analysis of Engineering Processes	2.5 points
058126- Fuel Cells	2.0 points
058187- Self-Assembly in Polymer Systems	2.0 points
056402- Molecular and Chemical Kinetic Modeling	3.0 points
056935- Design of Process Control Systems	4.0 points

B. Course list for the Academic Year of October 2021

*Core Course **Mathematical Course

Winter Semester

056394- Odor Fingerprints	Dr. Broza Yoav
056379- Membrane Processes Laboratory.	Assis. Prof. Segal Peretz Tamar
058127- Transport Phenomena – Fluid Flow*	Prof. Leshansky Alexander
058177- Mathematical Methods in Chemical Eng.**	Prof. Brenner Naama
056178- Approximate Methods in Chemical Eng.	Prof. Leshansky Alexander & Prof. Brandon Simon
058126- Advanced Topics- Fuel cells	Assoc. Prof. Dekel Dario
056166- Interfacial Phenomena	Prof. Paz Yaron
058145- Advanced Reactor Design*	Prof. Sheintuch Moshe
056120- Electron Microscopy	Assis. Prof Segal Peretz Tamar & Prof. Talmon Yeshayahu
058185-Solid State in Chemical Engineering*	Prof. Yoed Tsur

Spring Semester

058143- Transport Phenomena Heat and Mass*	Prof. Brandon Simon
058183- Polymers in Biotechnology	Prof. Bianco-Peled Havazelet
058186- Statistical Termodynamics*	Prof. Brenner Naama
058172- Polymer Thermodynamics	Prof. Cohen Yachin
056398- Catalysis on Surfaces	Assoc. Prof. Oz Gazit
056391- Sensors Based on Nano (Bio) Materials	Prof. Hossam Haick
056399- Engineering for Energy and Environment	Prof. Sergio Kapusta
056400- Process Safety in Chemical Engineering	Prof. Sergio Kapusta
058184- Polymer Characterization Laboratory	Assis. Prof. Segal Peretz Tamar
056397- Membranes Principles and Materials	Prof. Freger Viatcheslav
056402- Molecular and Chemical Kinetic Modeling	Assis. Prof. Grinberg Dana Alon

4. PhD studies

PhD studies focus on research work, while giving the students additional training via courses that expand and enrich their knowledge on topic at the forefront of Chemical Engineering.

We offer three lanes for PhD studies:

Regular lane

PhD direct lane from MSc

Special PhD - from BSc

Students will be admitted based on achievements in previous studies, letters of recommendation and individual interviews with two faculty members (separately). The purpose of the interviews is to assess the suitability of the candidate for PhD studies, his knowledge of fundamental topics, his approach to problem solving and independent thinking.

A. Regular Lane

Admission

- Candidates must have an average of at least 85 in their MSc.
- The MSc examiners committee's opinion on the candidate's suitability for PhD studies may be considered as a factor in candidate's admission.
- Graduates of non-thesis Master (ME) may be admitted to PhD in exceptional cases, and after the students demonstrates their research proficiency in the “Study without Graduation” lane, as determined by the Graduate Studies Committee.

Academic requirements

- Expand basic knowledge in Chemical Engineering and acquire knowledge needed to carry out the research, by studying courses usually consisting of 10 credits (at least four courses, not including the “Seminar in Chemical Engineering”).. Other formal requirements may be added in the admission interview stage by the recommendation of the interviewers, as well as after the candidacy exam following the committee's recommendation. The students must study at least two courses by the end of their second semester.
- Completing original research work at a proper level. The research will usually take place within the department. In exceptional cases of external students, they will be required a minimum of one year full-time stay at the department.
- The student must submit a research proposal and pass the candidacy exam accordance to the Graduate School protocol (see the Graduate school Regulations).

- Pass the exam in the course "Research Ethics" before submitting the research proposal for the candidacy exam.
- About a year after the candidacy exam, the student will present a seminar that describes the research directions and the results obtained up to that time. Usually, this is a short internal seminar open to faculty members and students.

B. PhD direct lane from MSc

Admission

Outstanding MSc students (average of at least 90 in their fields of study), may transfer to the direct PhD lane with the consent and recommendation of the research advisor, the recommendation of the Graduate Studies Committee and the approval of the Graduate School. The request to switch to direct PhD should be submitted to the Graduate Studies Committee in accordance with the requirements of the Graduate School.

Academic requirements

The academic requirements are 26 graduate credit points (11 courses at least), passing the candidacy exam, a seminar about a year after the candidacy exam, writing a thesis and a final exam.

C. Special PhD - from BSc

Admission

Only outstanding four year MSc graduates with a cumulative average of at least 90, will be admitted to this track.

Learning requirements

26 graduate credit points (11 courses at least), passing a candidacy exam, a seminar about a year after the candidacy exam, writing a thesis and a final exam. The student has to accumulate 15 credit points and pass the candidacy exam within three semesters from the beginning of the program.

5. Scholarships

A student who wishes to devote his full-time to his studying can request for a scholarship. Details on the scholarships and the procedures can be found on the Graduate School website: http://www.graduate.technion.ac.il/Heb/. The scholarships are granted to students with suitable accomplishments and according to their availability. The scholarship recipients must dedicate the entire time to studying, research and teaching. The recipient cannot work outside of the Technion without special permission. The faculty will make an effort to assign teaching positions to the scholarship recipients from their second semester, both for MSc and PhD. ME students are not eligible for a scholarship. **Please see the Graduate School protocol for detailed information on scholarship recipient's requirements!** MSc student who wishes to receive three scholarship portions and above must accumulate at least 75% of the required academic points within the first two semesters. Also the scholarship recipient has to complete 8 points in the first semester, and at least 12 points in the first year.

6. Procedures

A. Choosing a research topic

- The research topic will be coordinated with the research advisor.
- MSc scholarship recipients must submit their research proposal within the first two semesters of their studies.
- A condition for approving the research proposal is fulfilling the requirement in the course "Research Ethics". MSc students must pass the course exam before submitting the research topic.

B. Seminar attendance requirement

Attending the faculty seminars on Wednesdays at 13:30-14:30 (unless advertised otherwise) is mandatory for all graduate students. Absence must be reported to the graduate degrees coordinator or to the seminar supervisor. In the weekly seminars the research conducted in the faculty is presented, and guest lecturers present their research on various topics in Chemical Engineering. Most students present their graduate seminar in this forum.

C. Graduation

Current editing instructions for the thesis can be found on the Graduate School website: http://www.graduate.technion.ac.il/Heb/Graduation/Thesis_editing.asp

Each student must give a seminar lecture on the topic of his thesis. The lecture will be given during the last year of the student education. At least two weeks, but no more than a year, prior to submitting the thesis to the Graduate School. After completing the thesis and the exam, students must return the form "return of faculty property" to the Graduate Degrees office, according to the procedures detailed on the school website. A student who will not return this form will not be able to receive their graduation diploma.

7. Faculty Members and Research Fields

A. Faculty Members

Bianco-Peled Havazelet

Professor, D.Sc., Technion

Biomedical Polymers

Brandon Simon (Dean)

Professor, PhD - University of Minnesota

Materials processing, crystal growth, fuel cells, transport and interfacial phenomena; Computational analysis methods: The Finite Element Method (FEM), Lattice Boltzmann Methods (LBM), molecular simulations**.**

Brenner Naama

Professor, PhD, Technion

Theoretical biophysics: adaptation and learning in biological systems, gene regulation, exploration and adaptation in cell populations. Regulation of growth and division in cells. Dynamics and learning in neuronal networks, stability and instability of synapses and implication to memory and forgetting.

Dekel Dario

Associate Professor, PhD, Technion

Novel materials: ionomers, membranes, electro-catalysts and electrodes for advanced electrochemical systems that effectively produce and store green energy – Flow batteries, Pt-free novel fuel cells, electrolysis and other efficient energy devices and processes.

Farah Shady

Assistant Professor, PhD, The Hebrew University of Jerusalem

Functional and Medicinal Polymers, Biodegradable Polymers, Smart Materials and Composites for Medical Needs, Functional Polymeric Nanoparticles, Controlled Drug Release, Drug Crystals for Long-term Delivery, Bioactive Surfaces and Crosslinked Polymers, Antimicrobial and Antiviral Polymers, Shape-Memory Polymers, Cells Encapsulation and “Live Drug Factories” for Chronic Diseases, Hydrogels, 3D Printing of Medical Implants, Tissue Engineering, Personalized Medicine, Polymeric Systems for Cancer-Targeted Delivery.

Freger Viatcheslav

Professor, PhD, Ben-Gurion University of the Negev

Membrane technology for desalination, water purification and energy applications, including theorethical basis for transport and separations in membranes, fouling phenomena, development of novel membranes based on nanomaterials and advanced characterization techniques. The research has a strong overlap with the fields of chemistry and physics of polymers, surface phenomena, electrochemistry, fluid dynamics and biophysics.

Gazit Oz

Associate Professor, PhD, Technion **(Vice Dean of Graduate Studies)**

The lab works on applicative driven research to develop energy efficient and environmentally friendly processes. Specifically, we wish to promote the conversion of waste biomass and natural gas to alternative fuels and chemicals. The lab is equipped with state-of-the-art analytical techniques allowing us to study the properties of solid catalysts. Group member are experts in the preparation, characterization and testing of a variety of catalytic materials. Some examples include nano-porous materials, nano-particles and polymer-metal composite materials. The knowledge obtained in research is used to make the next generation catalysts better and more efficient.

Grader Gideon

Professor, PhD California Institute of Technology

Functional ceramic materials. Water splitting to H2 and O2 by advanced electrolysis

Grinberg Dana Alon

Assistant Professor, PhD, Technion

Our group focuses on a central problem in Chemical Engineering: quantitatively predicting the reactivity of various chemical systems. We develop simulation technology to solve practical problems in the crossroads of the Chemical Engineering discipline and Applied Energy research. Particularly, we are interested in scalable novel low-carbon approaches to the global energy and environmental crises, contributing to the development of alternative fuels and raw material synthesis from CO2 and natural gas. Our work combines both advanced computational chemistry and experimental approaches.

Haick Hossam

Professor, .PhD, Technion

Chemical sensors; wearable sensors; artificial sniffing systems (electronic noses); electronic skin; diagnosis of diseases via biomarkers; miniaturized laboratories for disease detection inside human body; non-invasive diagnosis of disease via breath and skin; the volatile chemistry of the cell.

Leshansky Alexander

Professor, PhD, Technion

Fields of interest: Fluid mechanics, complex fluids, advanced transport phenomena, propulsion at micro-/nanoscales, microfluidics

Lewin Daniel

Professor, D.Sc., Technion-Israel Institute of Technology

The integration of process design, control and operations

Manor Ofer

Associate Professor, The University of Melbourne, PhD.

We work on cutting edge science and technology for the reclamation of contaminated water and for the precision coating of surfaces. In particular, we employ surface phenomena (soft matter, colloids, molecular forces, and transport phenomena) and piezoelectric based MEMs (micro-electromechanical) platforms to manipulate and separate oil/water/solid mixtures to their individual components and to coat surfaces by thin films of simple and complex liquids.

Our theory projects are about:

a) AcoustoWetting (dynamic wetting of substrates by liquid films under the action of MHz-frequency surface acoustic waves) of free surfaces and nano-channels.
b) Using density functional theory along with theorems for colloidal forces to construct energy functionals for calculating the equilibrium state of complex liquids and for generating near equilibrium gradient dynamics models of transport in complex liquids.
c) Modelling optical tweezers force measurements of colloidal interactions.
d) Dendrite growth prevention by convective flow.

Our experiment projects are about:

a) AcoustoWetting of pure, mixture, and non-newtonian liquids.

b) Separating oil/water/solid mixtures.
c) The pattern deposition of mixtures of colloidal particles from a volatile carrier liquid.
d) Transport phenomena in volatile solvent mixtures.

Paz Yaron

Professor, Ph.D., Weizmann Inst. of Science

Photocatalysis, Photocatalytic systems for treating water and air, ultrafast transient IR spectroscopy as a tool for studying photocatalysts, molecular imprinting, Surface phenomena, Self-Assembled Monolayers, origin of life

Schroeder Avi

Associate Professor, Ph.D., Ben-Gurion University

Our research group is aimed at improving patients' quality of life and bettering their treatment by developing innovative medical technologies.
Specifically, we will focus on targeting metastatic cancer with nanotechnology, and on constructing miniature medical devices that couple diagnosis to therapy (theranostic devices). We are also interested in treating neurodegenerative diseases. Robotic systems for producing nanoparticles.

Segal-Peretz Tamar

Assistant Professorf, PhD, Technion

Materials, nanostructures, and processes for emerging nanotechnologies, nano fabrication in 2D and 3D, optical coatings, nano structures and materials for water technologies and molecular separation, polymer self-assembly, growth of inorganic materials within polymers, advanced characterization of nanostructures using electron microscopy including three-dimensional characterization.

Shoham-Patrascu Michael

Senior lecturer, PhD Technion

Process Intensification; Reaction Engineering; Process Systems Engineering; Membrane Reactors

Tsur Yoed

Professor, Ph.D., Technion-Israel Institute of Technology

Point defect chemistry; Electroceramics and electroceramic devices; Impedance spectroscopy measurements and its analysis; Flash sintering and other advanced sintering methods; Energy and fuel cells; Electro-chemo-mechanics of ceramic materials.

Zinger Assaf

Assistant Professor, PhD, Technion

The Zinger Lab aims to create advanced bioinspired technologies and translational therapeutics through a highly multidisciplinary approach. Specifically, we integrate in vitro and in vivo models with imaging, molecular biology, and chemical techniques to design novel nano-based technologies that will achieve organ and cell-specific targeting for improved therapeutic outcomes in different brain and neural diseases and injuries and various cancers.

B. Emeriti

Cohen Yachin

Professor Emeritus, PhD, University of Massachusetts.

The structure of polymeric systems in the solid, solution and gel states, studied by scattering methods (x-rays, neutrons) and electron microscopy. Processing advanced materials from cellulose and conversion of biomass to fuel. Advanced materials from rigid polymers, carbon nanotubes and graphene. Gelation in solutions of natural and synthetic polymer. Ultra-light weight polymeric foam.

Hasson David

Professor Emeritus, PhD, University of London.

D.I.C. Imperial college of Science, Technology and Medicine; Ph.D. University of London

Membrane Separation Processes, Desalination Processes, Water Treatment Technologies.

Kehat Ephraim

Professor Emeritus, D.Sc., Massachusetts Institute of Technology

Massachusetts Institute of Technology. Developing new processes, attacking conventional theories.

Marmur Abraham

Professor Emeritus, D.S.c., Technion

Interfacial Phenomena: Super-hydrophobic surfaces; Assessment of surface energy; Surface tension and Interfacial tension.

Thermodynamics: solubility and dissolution; equation of state**.**

Narkis Moshe

Professor Emeritus, D.Sc., Technion

Electrical behavior of electrically conducting polymeric systems. Multi-phase systems. Composite and nano-composite materials.

Nir Avinoam

Professor Emeritus, PhD, Stanford University

Fluid mechanics; Transport phenomena in suspensions; Multi-phase fluids.

Pismen Leonid

Professor Emeritus, Ph.D., Karpov Physico-Chemical Institute, Moscow.

Research in theory of transport processes and dynamics o nonlinear non- equilibrium systems, especially in physico-chemical and biological applications.

Ram Arie

Professor Emeritus, D.Sc., M.I.T., Cambridge

Structure and Physical Properties of Polymers, Rheology of Polymeric Melts, Characterization Recycling, Ageing, Polyblends.

Semiat Raphael

Professor Emeritus, D.Sc, Technion,

Separation processes in the chemical industry, equipment for separation processes, processes for water, produced water and industrial wastewater purification, energy in water processes, membranes for water treatment, desalination.

Sheintuch Moshe

Prof Emeritus, PhD, University of Illinois

Research interests: Chemical and Catalytic Reaction Engineering: Chemical Reactor Dynamics, Catalysis, Catalytic kinetics from first principles; Membrane reactors.

Tadmor Zehev

Distinguished Professor Emeritus, D.Sc., Stevens Institute of Technology.

Talmon Yeshayahu

Professor Emeritus, PhD, University of Minnesota

Areas of research: Self-aggregation; colloidal systems; nanostructure of synthetic and biological complex liquids; meso-phases; electron microscopy (TEM and SEM) applications in chemical engineering and biophysics.