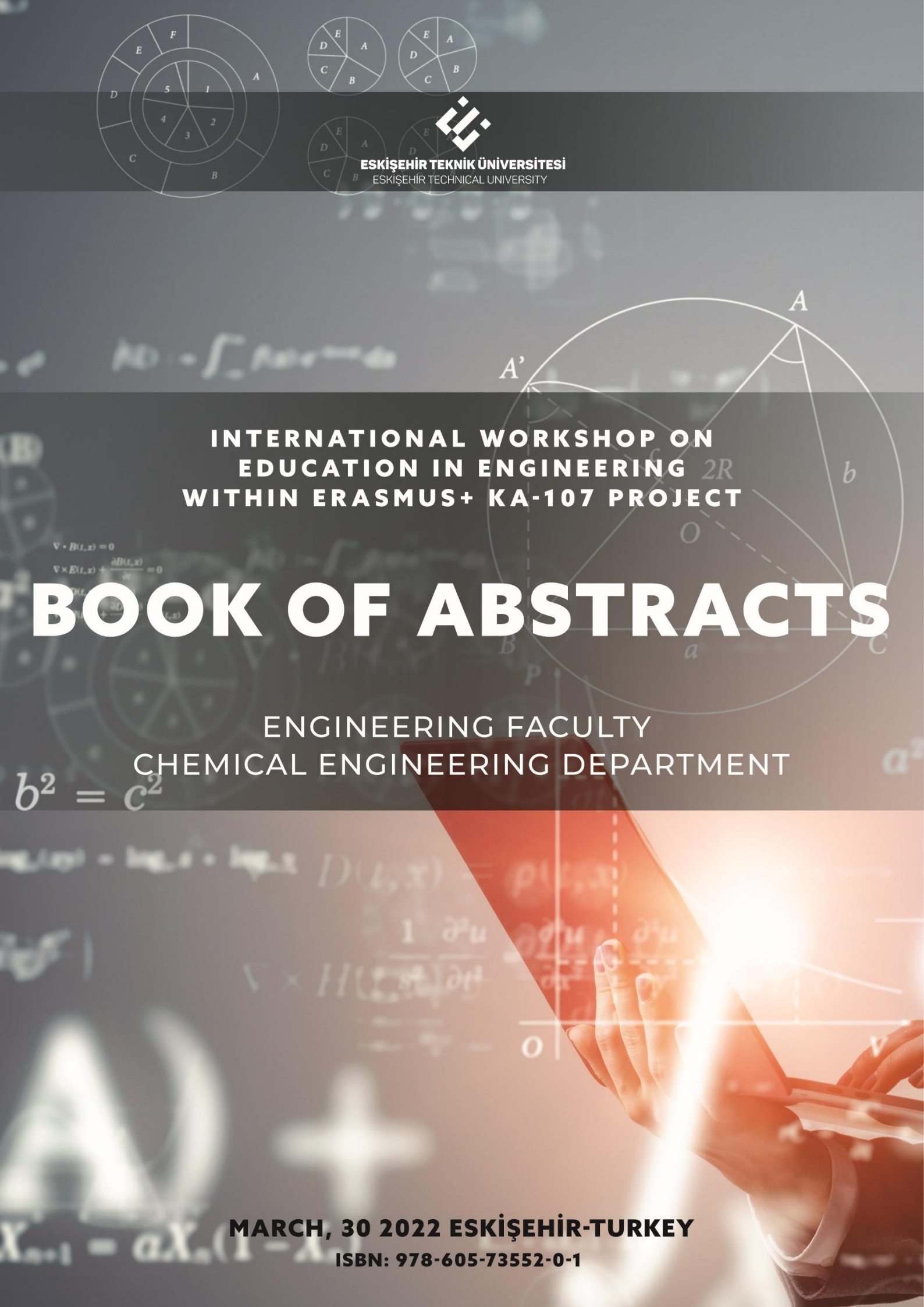
ESKİŞEHİR TEKNİK ÜNİVERSİTESİ
ESKİŞEHİR TECHNICAL UNIVERSITY

INTERNATIONAL WORKSHOP ON
EDUCATION IN ENGINEERING
WITHIN ERASMUS+ KA-107 PROJECT

BOOK OF ABSTRACTS

ENGINEERING FACULTY
CHEMICAL ENGINEERING DEPARTMENT



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Workshop Program

	Presenter	Presentation Title
10:10	Assoc. Prof. Dr. Mustafa Muradov Baku State University (BSU), AZERBAIJAN	Academy and Industry Collaboration
10:30	Dr. Ofeliya Balayeva Baku State University (BSU), AZERBAIJAN	Active Learning in Distance Education
Coffee Break		
11:10	Assoc.Prof.Dr. Artem N. Bezrukov Kazan National Research Technological University (KNRTU), RUSSIA *(Online Presentation)*	Development of Online Learning Courses for Smart Materials Engineering Education Programs
11:30	Res. Asst. Günel Aliyeva Baku State University (BSU), AZERBAIJAN	Improved Laboratory Manual Designs
11:50	Assoc. Prof. Dr. Nuray Gedik Asst. Prof. Dr. Zehra Yiğit Avdan Eskisehir Technical University (ESTU), TURKEY	Interactive Experiment Videos for Graduate Studies: A Case for Dye Removal by Carbon-Based Material
12:10	Asst.Prof.Dr. Engin Kapkın Eskisehir Technical University (ESTU), TURKEY	Design Thinking and Creativity
Lunch Break		
14:00	Assoc.Prof.Dr. Tilda K. Akiki Holy Spirit University of Kaslik (USEK), LEBANON	A review on effective teaching and learning in Higher Education with an emphasis on Resilient Women during the COVID 19 pandemic and an extreme economic and financial crisis – USEK and Lebanon case study
14:20	Asst. Prof. Dr. Rita Harb Holy Spirit University of Kaslik (USEK), LEBANON	Instructional Modes in Distance Education
Coffee Break		
15:00	Prof.Dr. Nezihe Ayas Eskisehir Technical University (ESTU), TURKEY	STEM Education
15.20	Assoc.Prof.Dr.Yeşim Güçbilmez Eskisehir Technical University (ESTU), TURKEY	Soft Skills in Engineering
15:40	Asst.Prof.Dr. Elif Kaynak Uraz Eskisehir Technical University (ESTU), TURKEY	Teaching with MATLAB
16:00	**Closing Remarks**	

Rector's message…

Eskisehir Technical University (ESTU) is a public higher education institution that organizes associate degree, undergraduate, Master and PhD programs. ESTU is dedicated to provide quality education according to the university motto: Innovation for Future.

International cooperation, which is also included in the our university's internationalization policy, has a wide framework that includes many activities such as joint research, education, publication, event (conference, workshop, etc.), employee and student exchanges, and it is aimed to develop the aforementioned collaborations according to the competence of the institution. The approach to internationalization of our university is not just a vicious circle of international student and employee exchange mobility. Establishing the Internationalization Policy, determining the goals, targets and indicators for internationalization in the Strategic Plan, are among the most important proofs of this. Targets and performance indicators for the necessary strategies for achieving the goals of internationalization were determined to support the development of the required management and organizational structure.

ESTU also takes initiatives to provide training for instructors on new techniques and applications in engineering education. The current workshop provides a good basis for sharing good practices and identifying challenges and opportunities for education in the post-COVID world. We are pleased to welcome all participants of the International Engineering Education Workshop at Eskişehir Technical University.

Prof. Dr. Tuncay DÖĞEROĞLU

Preface

Within the scope of Eskişehir Technical University's (ESTU) Strategic Plan to establish sustainable international cooperation, Department of Chemical Engineering of ESTU is carrying out Erasmus+ KA-107 projects titled "Education in Engineering" with the Nano Research Center of Baku State University (BSU), Chemistry and Petroleum Engineering Department of Holy Spirit Technical University of Kaslik (USEK), and Physical and Colloidal Chemistry Department of Kazan National Research Technological University (KNRTU), between May 2020- May 2023. Within the content of the projects, academic staff mobilities of teaching and training were made between institutions, seminars were given, and joint collaborations were started. Project participants presented their related research on March 30, 2022 at an International Workshop called "Education in Engineering" which also had participants from ESTU. A concise description of these presentations is compiled in this abstract book.

On behalf of organizing committee, I kindly thank to the International Office of ESTU for their dedication and contributions to the project.

Prof.Dr. Nezihe AYAS

Head of Chemical Engineering Department

ACADEMY AND INDUSTRY COLLABORATION

Mustafa Muradov

Baku State University, Nano Research Laboratory, Baku, Azerbaijan

Abstract: In this presentation, the author will describe the role of University-Industry collaboration in modern society. Roles of government on the Academic – Industry collaboration will also be discussed. Interaction, mutual enrichment and development of universities and industry will be explored. The mechanisms of stimulation of the collaboration process will be discussed. Research demands incoming from the industry; regionally and nationally will also be discussed. Finally, the current situation and the perspectives will be stated.

Mustafa MURADOV

Assoc. Prof. Mustafa Muradov works as the head of the Nano Research laboratory and the Deputy Director of the Excellence Center of Baku State University. His research interests are in the areas of growth and formation of nanomaterials and physico-chemical processes on low dimensional structures. He is an author of 95 publications in peer-reviewed scientific journals and his google scholar h-index is 12.

ACTIVE LEARNING IN DISTANCE EDUCATION

Ofeliya Balayeva

Baku State University, Nano Research Laboratory, Baku, Azerbaijan

Abstract: In modern times, especially after the pandemic has entered our lives, distance education has begun to grow rapidly both in the academic environment and in various fields of teaching. Various interactive resources, media, distance, and mass online courses, which are used to organize the training, are widely distributed in the educational system. Here the priority tasks are:

- Creation of new favorable structures in distance education
- Enrichment of educational resources
- Development of quality standards
- Improving the quality of distance education and developing innovative approaches for learning outcomes

Ofeliya BALAYEVA

Dr. Ofeliya Balayeva has Ph.D. in chemistry. She works as a lecturer and staff researcher at the Department of High Molecular Compounds at the Faculty at Chemistry in BSU. Her research area is synthesis of nanocomposites based on metal sulfides, oxides, and layered double hydroxide structures on the base of polymer matrices: Their modification, material characterization and photocatalytic performance evaluation.

DEVELOPMENT OF ONLINE LEARNING COURSES FOR SMART MATERIALS ENGINEERING EDUCATION PROGRAMS

Artem Bezrukov

Kazan National Research Technological University, Department of Physical and Colloid Chemistry, Kazan, Russia

Abstract: In time of reduced academic mobility opportunities due to pandemics, we are seeking options to deliver international academic programs in the remote teaching mode. We report the results of a large-scale project implemented by Kazan National Research Technological University. The main goal was to develop online alternatives for offline courses within the framework of a newly created “Smart Materials” Master’s degree program. Transforming an existing offline engineering course into an online delivery mode turns out to be not a straightforward process. It requires blending the best components of an academic program: This course belongs to an integrated and standalone course that resembles its offline counterpart but is an independent academic product. We share the experience of Physical and Colloid Chemistry Department at KNRTU in developing such online courses and also transforming the laboratory environment to facilitate the transit to the online delivery mode of engineering programs.

Artem N. BEZRUKOV

Artem Bezrukov is an associate professor at the Department of Physical and Colloid Chemistry at the Kazan National Research Technological University. His research activities focus on microfluidics and applications of laboratory research on chip technologies to supramolecular chemistry. As an engineering educator, he is involved in development of international academic programs in materials science and physical chemistry.

IMPROVED LABORATORY MANUAL DESIGNS

Günel Aliyeva

Baku State University, Nano Research Laboratory, Baku, Azerbaijan

Abstract: Science is constantly evolving. Curricula taught at universities also change and improve in accordance with the requirements of the time. Accordingly, laboratory manuals must change and evolve. Science learning is practical, which means it necessitates practical laboratory activities while also requiring broad-based experiences to broaden students' understanding of a world of chances to give meaning to the knowledge they have gained from lectures. Furthermore, science learning entails experimentation with hands-on and mind-on activities in order to gain better knowledge. However, if there are no laboratory guidelines to be used or if the existing laboratory guidelines do not meet the requirements of the advanced and current period currently being taught, how can these practical activities be done properly? These are the primary considerations while developing laboratory manuals. In addition, the Covid-19 pandemic has shown that lectures and seminars can be taught remotely. However, teaching laboratory classes from a distance were very difficult. Laboratory classes are especially important in engineering. At present, the creation of interdisciplinary courses, joint research and interdisciplinary research units are very relevant. These should also be taken into account in the development of laboratory manuals.

Günel ALIYEVA

Günel Aliyeva is an employee at the Nano Research Laboratory of the Excellence Center for Research, Development and Innovation at Baku State University. She is also a PhD student at the Department of Organic Chemistry. Her research area is the synthesis of new compounds based on C-H activation and the preparation of their supramolecules with nanoparticles.

INTERACTIVE EXPERIMENT VIDEOS FOR GRADUATE STUDIES: A CASE FOR DYE REMOVAL BY CARBON-BASED MATERIAL

[1]İlknur Demirtaş, [2]Nuray Gedik, [3]Zehra Yiğit Avdan

[1,3]Eskisehir Technical University, Department of Environmental Engineering, Eskisehir, Turkey
[2]Eskisehir Technical University, Learning and Teaching Development Unit, Eskisehir, Turkey

Abstract: With the COVID-19 pandemic, switching to distance learning from face-to-face education has accelerated the search for digital learning options. Educational videos are widely used in various fields in open and distance learning and have great potential to be used in graduate education with the interactive features. In this study, it is basically aimed to digitally record graduate experimental processes in engineering education settings and prepare them as interactive videos to be used in learning and teaching processes during graduate education. The experiments were related to removal of dyes, which have been widely used in many fields such as plastic, cosmetics, chemistry, especially in the textile industry from past to present. However, dyes create a serious problem for the environment, people and aquatic creatures. For this reason, they must be treated before discharged. Adsorption is a simply designed, widely applied, easy to use, efficient, effective and cheap option for dye removal. Carbon-based adsorbent materials with low energy requirement, low cost and high adsorption capacity have been used as adsorbent materials from past to present. We aim to introduce our project of adsorption kinetic study with carbon-based materials in dye (methylene blue) removal and share our experiences in recording the experiments and designing them as interactive videos

Zehra YİĞİT AVDAN

Zehra YİĞİT AVDAN graduated from Anadolu University, Environmental Engineering Department in 2006. She started to work as a research assistant at Anadolu University in 2006. She completed her master's and doctorate studies in the same department. She continues to work as a doctoral faculty member at Eskisehir Technical University.

İlknur DEMİRTAŞ

İlknur DEMİRTAŞ graduated from ESTU, Department of Environmental Engineering. She had her MSc degree from the same department and is continuing her Ph.D studies. She currently has a scholarship at ESTU Department of Environmental Engineering within the 100/2000 YÖK Doctorate Program.

Nuray GEDİK

Nuray GEDİK is an Assoc. Prof. at the Learning and Teaching Development Unit in ESTU. She has earned her undergraduate and graduate degrees from METU in the field of Computer Education and Instructional Technology. Her research interests include e-learning, blended learning, instructional design, and technology-enhanced learning.

DESIGN THINKING AND CREATIVITY

Engin Kapkın

Eskisehir Technical University, Department of Industrial Design, Eskisehir, Turkey

Abstract: Design thinking is a concept that refers to a combination of cognitive, strategic, and practical processes that are used to generate innovative design solutions. The concepts align with the traditional creative processes where convergent and divergent thinking is emphasized. This short course aims to introduce the relationship between creativity and design thinking processes. It then presents the design thinking phases and the actions dedicated to each phase. The course will be ended with suggestions and exemplary studies that allocate design thinking processes within their progression.

Engin KAPKIN

Engin Kapkın received a Master of Science in Industrial Design from Anadolu University, Turkey. He earned a master's in industrial design and a Ph.D. in Design from North Carolina State University, USA as a Fulbright Scholar. Kapkın engaged in several research projects during his fellowship at the Research in Ergonomics and Design Laboratory (REDLab). He is a product designer, design researcher, and educator who worked at the T-Design office, and Ford in Turkey; interned at IDEO, CA office, and DXlab design in Raleigh, North Carolina.

A REVIEW ON EFFECTIVE TEACHING AND LEARNING IN HIGHER EDUCATION WITH AN EMPHASIS ON RESILIENT WOMEN DURING THE COVID 19 PANDEMIC AND AN EXTREME ECONOMIC AND FINANCIAL CRISIS – USEK AND LEBANON CASE STUDY

Tilda K. Akiki

Holy Spirit University of Kaslik, Electrical, Telecommunications and Computer Engineering Department, Kaslik, Lebanon

Abstract: The presentation covers two sections:

The first section provides a review of some approaches for developing Teaching and Learning in Higher Education (HE) institutions. It explores new techniques to preserve the good quality of teaching and to enhance the quality of our students' learning experience. It discusses **Teaching** and **Supporting Learning** in HE, the **Design** and **Evaluation** for teaching and learning in HE as well as the **Assessment** and **Feedback** strategy.

The second section presents real examples for what was stated in the previous part. It discusses **Resilience** in time of crisis and **Sustainability** in times of needs. It emphasizes on an iterative and reflexive process towards equality at the institutional level as well as the establishment of a community of practice within the institution, which are keys to Resilience and Sustainability in HE.

Tilda K. AKİKİ

Tilda Karkour Akiki has graduated from the Lebanese University. She got her master's degree in Industrial Control from the Lebanese University in collaboration with Université de Technologie de Compiègne in France in 2002 and her PhD from Université de Technologie de Belfort-Montbéliard, in France in 2011. She also holds a postgraduate certificate in "Teaching and Learning in Higher Education" from Chester University since 2013.

INSTRUCTIONAL MODES IN DISTANCE EDUCATION

Rita Harb

Holy Spirit University of Kaslik, Department of Chemical and Petroleum Engineering, Kaslik, Lebanon

Abstract: Distance education is simply a method of teaching where the student and the teacher are physically separated. Distance education has evolved during the decades until becoming a major component of education globally after the Covid-19 pandemic. Distance education uses one or more of technologies to deliver instruction to students who are separated from the instructor and supports regular and substantive interaction between the students and the instructor, synchronously or asynchronously. This presentation states and defines the different instructional modes for an effective education. In addition, it sheds light on the process of selecting the suitable instructional mode depending on the preferences and circumstances of the audience known as adult learners.

Rita HARB

Rita Harb (PhD, ENG): received the Ph.D. degree in Energy and Process Engineering from MINES ParisTech in 2021 and the Engineering degree in Chemical Engineering from the Holy Spirit University of Kaslik in 2018. She is an assistant professor at the Holy Spirit University of Kaslik. Her research interests include biomass gasification, tar treatment, renewable energy, water treatment and cryogenics.

STEM EDUCATION

Nezihe Ayas, Alattin Çakan

Department of Chemical Engineering, Eskisehir Technical University, Eskisehir, Turkey

Abstract: STEM education is an integrative discipline of Science, Technology, Engineering and Mathematics and their associated practices that play a supporting role in active learning strategies in instruction, as well as in supporting student-centered learning environments while aiding students in developing critical thinking to real world issues and challenges and assisting them in investigating the complexity, current status, and potential solutions to those through knowledge and tools of these multiple disciplines. In this context, STEM education is deemed a conspicuous landmark for the development of the modern education system to prepare future generations.

Nowadays, STEM education is part of the curriculum in many education systems in the United States, Australia, and some Western countries. From an international viewpoint of STEM education, each country around the world applies different approaches to implement it; in some countries it is embedded within educational curriculum, while in others, it is being delivered through public organizations.

Nezihe AYAS

Nezihe Ayas is a full professor of Chemical Engineering at the Chemical Engineering Department, Faculty of Engineering (ESTU). She is head of Chem. Eng. Department and Unit Operations and Thermodynamics Division. Her research interests include gasification technology, energy conservation, hydrogen energy and fuel cells, storage technologies, bioenergy systems, biodiesel production and catalyst preparation for biofuel and hydrogen production. 18 master's and 2 doctoral theses have been completed under her supervision, and 2 master's and 7 doctoral theses are still ongoing. She contributed to the literature by writing 3 book chapters, 40 publications in the international peer-reviewed journals.

Alattin ÇAKAN

At present, he studies in integrated PhD. in Chemical Engineering at Eskişehir Technical University and holds a bachelor's degree from Anadolu University. He is currently studying sustainability, energy conservation, hydrogen energy and fuel cell technologies, waste management and environment, and pursue his goal of participating in global cooperation to build a better future.

SOFT SKILLS IN ENGINEERING

Yeşim Güçbilmez

Department of Chemical Engineering, Eskisehir Technical University, Eskisehir, Turkey

Abstract: Soft skills or socio-emotional skills that a person uses to communicate with other people in order to build a social environment. Presently, around the world, for most careers, competence in soft skills is a priority for getting a good job in the labor market. Soft skills in the work place involve key skills such as communication, team work, leadership, professional ethics, , creativity, problem solving and more. These skills help individuals to communicate well with their colleagues, to continue their professional development and to have good interpersonal relations, thus part of university education should involve acquisition of soft skills.

Yeşim GÜÇBİLMEZ

Yeşim Güçbilmez graduated from the Department of Chemical Engineering of Middle East Technical University (METU) in the year 1996 as the third best graduate of the department. She is presently an Associate Prof. Dr. at the Department of Chemical Engineering of ESTU and is also the Erasmus+ Department Coordinator. She has taught courses such as Chemical Reaction Engineering 1 and 2, Process Control, Mathematical Modelling among others. Her research interests are Materials' Synthesis', Characterization and Applications, Nanomaterials and Oxidation Reactions.

TEACHING WITH MATLAB

Elif Kaynak Uraz

Department of Chemical Engineering, Eskisehir Technical University, Eskisehir, Turkey

Abstract: The students are expected to acquire skills to use the information technologies effectively within accredited engineering programs. MATLAB software is widely used to teach programming and mathematical modeling in engineering courses. MATLAB provides an interactive environment for programming, data visualization and numerical computing. It has become a powerful tool for engineering problem solving. The first part of the presentation focuses on the implementation of MATLAB Live Script and MATLAB Grader through classroom exercises included in the syllabus of a second year (introductory) computer programming course. In the second part, the use of MATLAB in a project-based design activity assigned to the fourth-year chemical engineering students is presented. The project-oriented learning approach may address the problems associated with the graduates' lack of experience and inability to put their fundamental engineering knowledge into industrial practice. The advantages of implementing programming in project-oriented learning is discussed.

Elif KAYNAK URAZ

Elif KAYNAK URAZ is currently an Assistant Professor at Department of Chemical Engineering at ESTU where she also serves as the Deputy Department Head of Education. She received her bachelor's degree in Chemical Engineering from Ege University in 2008. She holds a master's degree in Nanotechnology from Anadolu University. She commenced her academic career as a Research Assistant at the Department of Chemical Engineering, Anadolu University in 2014. She received a PhD in Chemical Engineering in 2019 from Department of Chemical Engineering, Eskisehir Technical University. Her research interests include functionalization of textiles, thermal degradation and flame retardancy of textiles and polymeric materials and development of flame retardant formulations for polymers.