FACULTY OF ENGINEERING AND ARCHITECTURE

BULLETIN

DECEMBER 2025

WHAT YOU WILL READ IN THIS ISSUE:

News from Faculty

Actuel Topics in Engineering and Architecture

Academic and Scientific Activities

İGÜ Faculty of Engineering and Architecture Announces a Project Competition for High School Students (Grades 9–12)!

Join the Project Festival!

Dear Students,

The Future Engineers and Architects Project Festival is being organized under the auspices of Istanbul Gelisim University. High school students enrolled in 9th, 10th, 11th, and 12th grades who reside in Istanbul are eligible to participate in the Project Festival. Applications will be accepted between 15 December 2025 and 1 March 2026.

To apply for the competition, applicants must select one thematic field from among five thematic areas grouped under four main disciplines.

Istanbul Gelisim University

Future Engineers and Architects Project Festival

(Project Competition for High School Students – Grades 9–12)

Main Disciplines

***Computer and Software Engineering**

***Electrical, Electronics, and Mechatronics Engineering**

***Civil Engineering and Architecture**

***Industrial Engineering**

FACULTY OF ENGINEERING AND ARCHITECTURE

NEWS FROM THE FACULTY

MONTHLY BULLETIN

DECEMBER 2025

NEWS FROM THE FACULTY

● INDUSTRIAL ENGINEERING ●

2025 Alumni Reunion Held

The 2025 Alumni Reunion, organized by the Istanbul Gelişim University Alumni and Members Coordination Office, was held on Friday, December 19, 2025, in the Mehmet Akif Ersoy Conference Hall.

The event, held between 17:00 and 21:00, brought together alumni from different periods and departments of the university, giving them the opportunity to reminisce about old memories and forge new connections. The reunion, which took place in a warm and enthusiastic atmosphere, made a significant contribution to strengthening the bonds between alumni and the university. In the speeches given during the program, it was emphasized that the academic and professional achievements of the alumni are a great source of pride for the university. Participants expressed their happiness at witnessing the development of the university and being a part of this family.

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NEWS FROM THE FACULTY

ELECTRICAL ELECTRONICS ENGINEERING

International Conference Paper by Our Faculty Member Dr. Ercan Aykut

Dr. Ercan Aykut, a faculty member of the Department of Electrical and Electronics Engineering at our university, and his graduate student Saif Alhusseini have achieved a significant international academic success with their scientific work. The researchers successfully presented their paper entitled “Generator at Turbine” at the 5th International Conference on Scientific and Innovative Studies (ICSIS 2025), thereby contributing to the conference.

The study focuses on the performance of generator and turbine structures used in energy generation systems and offers innovative approaches aimed at increasing system efficiency. The paper was evaluated and accepted by a scientific committee consisting of experts in the field and was published in the conference proceedings.

The ICSIS 2025 Conference, organized at an international level, aims to bring together researchers from different countries to promote scientific knowledge sharing and interdisciplinary collaboration. The participation of Dr. Ercan Aykut and graduate student Saif Alhusseini in this prestigious event is of great importance in terms of enhancing our university’s scientific productivity and international visibility.

We congratulate our faculty member and student for their successful academic work and wish them continued success in their future scientific studies.

NEWS FROM THE FACULTY

ELECTRICAL ELECTRONICS ENGINEERING

Hands-On Training with Piezoelectric Sensors

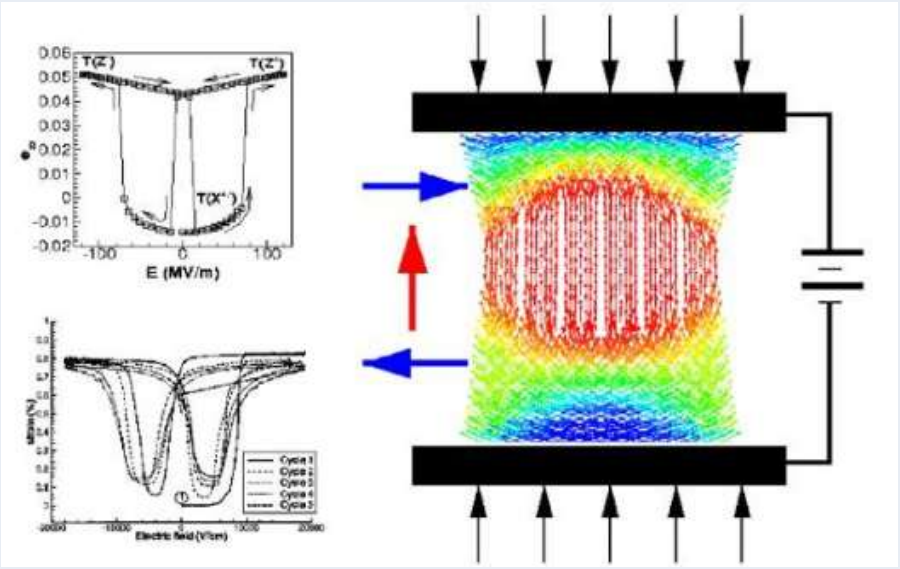
Students of the Department of Electrical and Electronics Engineering carried out a comprehensive study on piezoelectric sensors within the scope of a hands-on course conducted under the supervision of Dr. Ercan Aykut. This laboratory-based application provided students with the opportunity to directly experience and reinforce the theoretical knowledge they gained in their courses.

Within the scope of the study, students learned about the physical structure and operating principles of piezoelectric sensors. The piezoelectric effect, which is based on the conversion of mechanical vibration and pressure into electrical signals, was examined in detail through experimental studies. In addition, the students evaluated various application areas of piezoelectric sensors and discussed examples of their use in industrial applications.

In the continuation of the application, students learned how to integrate piezoelectric sensors with circuit components and carried out soldering and connection practices. Through these activities, students not only improved their basic laboratory skills but also gained hands-on experience working with electronic hardware.

This study, conducted in line with a hands-on education approach, made a significant contribution to the development of students' analytical thinking, problem-solving, and practical skills. At the same time, it increased students' awareness of sensor technologies and added value to their professional competencies.

As the Department of Electrical and Electronics Engineering, such hands-on activities that enable our students to closely experience modern engineering practices will continue to be supported and expanded.



NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

Prof. Dr. Mustafa KARAŞAHİN was awarded the 40th Anniversary Honorary Certificate in his profession.

As part of the 71st anniversary of the Chamber of Civil Engineers (IMO), Prof. Dr. Mustafa KARAŞAHİN, a faculty member of our department, was presented with a plaque and a certificate of honor in recognition of his 40 years of professional service.
This distinguished recognition reflects Prof. Dr. Mustafa KARAŞAHİN's long-standing contributions to the civil engineering profession, as well as his academic achievements and dedication to the field.
The department congratulates Prof. Dr. Mustafa KARAŞAHİN on this well-deserved honor and wishes him continued success in his academic and professional endeavors.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

Our Civil Engineering Department Represented at the 9th Asphalt Symposium

The 9th Asphalt Symposium was held at the General Directorate of Highways in Ankara. Prof. Dr. Mustafa KARAŞAHİN, a faculty member of the Civil Engineering Department, participated in the symposium as a session chair.

In addition to serving as a session chair, Prof. Dr. Mustafa KARAŞAHİN also took part as a member of the organizing, executive, and scientific committees of the symposium. The event brought together academics, researchers, and industry professionals to discuss recent developments in asphalt engineering.

The main theme of the symposium focused on asphalt production and usage within the framework of a zero-emission approach, emphasizing sustainable and environmentally friendly practices. The symposium provided an important platform for sharing innovative solutions in asphalt technologies.

The department extends its appreciation to Prof. Dr. Mustafa KARAŞAHİN for his valuable contributions and representation at the symposium.

● CIVIL ENGINEERING ●

Master's Student of the Department Chair Successfully Defended His Thesis

Waleed Abdulhussein Khraibet ALBUSIAD, the MSc student of the Civil Engineering Department Chair Asst. Prof. Ahmad Reshad NOORI, successfully defended his thesis titled "Effect of Dimensions on the Free Vibration Analysis of Suspension Bridges," completing his master's degree.

The study investigated the influence of bridge dimensions and geometry on the free vibration behavior of suspension bridges, highlighting the importance of dimensional parameters in vibration-based bridge design. The thesis was recognized as a strong academic work reflecting focus, discipline, and effective application of engineering principles.

The department congratulates Waleed Abdulhussein Khraibet ALBUSIAD on his successful thesis defense and wishes him continued success in his academic and professional career.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

Technical Tour from the IGU Civil Engineering Club

The IGU Civil Engineering Club organized a technical trip to the Istanbul Water and Civilizations Museum and Kirazlı Bent. During the visit, students had the opportunity to learn on-site about water management, historical water structures, watershed protection principles, and the development of Istanbul's water supply systems.
Experts from İSKİ provided detailed information on the historical significance, current operation, and preservation processes of these water structures. Participants also examined the architectural and engineering features of the Kirazlı Bent water reservoir.
We extend our appreciation to İSKİ for hosting our students and to all participants for their engagement.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

IGU Civil Engineering Club Visits the Concrete Fair

The IGU Civil Engineering Club organized a technical visit to the concrete fair to enhance students' professional knowledge and experience. During the visit, students had the opportunity to closely examine recent developments, innovative products, and modern production techniques in concrete technology.

Students toured company booths and received information on concrete production processes, sustainable materials, special concrete types, and various application areas. By interacting directly with industry representatives, students were able to ask professional questions and gain practical insights into the sector.

The technical visit supported students in linking theoretical knowledge with real-world applications and encouraged direct engagement with the construction industry. The event provided a productive learning experience that contributed to students' professional development.

The department extends its appreciation to all participating students for their involvement in the technical visit.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

Civil Engineering Students Participate in Genç-IMO Istanbul Branch Networking Breakfast

Students from the Civil Engineering Department, Berilsu ÖNDERIŞIK, Arda KÖSE, Mustafa Burak ARSLAN, Rıdvan ALPAĞAT, Ece TOKTAY, Hatice ATAKUR, and Noel Saa Molio MILLIMONO, participated in a networking breakfast organized by the Genç-IMO Istanbul Branch.

The event brought together student members and representatives of the Genç-IMO Istanbul Branch, providing an opportunity for introduction and interaction. General information was shared regarding the activities of the chamber and branch, as well as planned educational events, seminars, symposiums, and technical visits for the upcoming period.

The gathering offered a valuable platform for students to become more familiar with professional organization activities and to strengthen their sense of professional solidarity. The department extends its appreciation to the students for their participation and representation.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

Civil Engineering Students Participate in the Genç-IMO 16th Student Assembly

Civil engineering students Berilsu ÖNDERIŞIK, Arda KÖSE, and Mustafa Burak ARSLAN participated in the Genç-IMO 16th Student Assembly Meeting, held in Ankara and bringing together civil engineering students from across Türkiye.

During the assembly, presentations and discussions addressed topics such as the organizational structure of Genç-IMO, challenges faced by university students, professional solidarity, engineering ethics, and social responsibility in engineering. Students from various branches actively shared their views and contributions throughout the sessions.

The meeting concluded with the election of the Genç-IMO 16th Term Student Council. The assembly provided a valuable opportunity for students to enhance their professional awareness and engagement within the civil engineering community.

The department extends its appreciation to our students for their participation and for representing the department at the assembly.

NEWS FROM THE FACULTY

● CIVIL ENGINEERING ●

IGU Civil Engineering Club Participated in the Club Promotion Week

The Club Promotion Week was held at Istanbul Gelişim University on 11–12 December 2025. The event provided students with the opportunity to learn more about student clubs' academic, social, and cultural activities. As part of the event, the IGU Civil Engineering Club participated with its own information stand.

During the promotion week, students visiting the stand were informed about the club's mission, areas of activity, and previously organized technical visits, seminars, and social events. Through direct interaction with club members, students gained insight into the club's contributions to professional and academic development.

In addition, information was shared about the club's planned future activities, and guidance was provided for students interested in joining the club. Visitors had the opportunity to ask questions and engage in one-on-one discussions with club representatives.

Through its active participation in the Club Promotion Week, the IGU Civil Engineering Club contributed to increasing student engagement and encouraging participation in departmental and extracurricular activities.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

The study titled “Assessment of the Integrated Lighting System: Istanbul Gelisim University, Block K Tower Building” authored by Nahid Babaei, an MSc graduate in Architecture, and Assist. Prof. Semih G. Yıldırım (PhD) in the Department of Architecture, was presented at the “14th ATMK National Lighting Congress” held at the Faculty of Architecture, Istanbul Technical University in November 27-28, 2025. The study was derived from the first author’s completed master’s thesis.

In this study, an integrated lighting approach is examined within the spatial transformation process of the 18th-floor office level of the Block K Tower Building at Istanbul Gelisim University. The open-plan office layout (PLT 1) and the group office / co-working layout (PLT 2) are compared and evaluated in terms of the interaction of natural and artificial light, visual comfort, and energy efficiency. Within the scope of the study, parameters that determine comfort in offices—such as illuminance level, luminance, colour, surface reflectance ratios, and the visible light transmittance of glazing—are first addressed based on the literature. Subsequently, the ceiling lighting scheme, designed according to zoning principles and integrated with motion and photosensor controls in the renewed automation system, is described. Using computer software and illuminance level simulations for different dates are carried out to compare the performance of the two plan types. The results indicate that natural lighting is particularly insufficient in December, making artificial lighting support essential to meet the minimum required illuminance. The photosensor-controlled system reduces unnecessary energy consumption by operating only when needed and supports appropriate lighting conditions in the offices. The findings highlight the importance of the balanced integration of natural and artificial lighting in sustainable office design and provide a basis for subsequent luminance analyses.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

The study titled “The Use of Skylights in Curved Ceilings: An Evaluation of Lighting Efficiency” authored by Ebrar Sugün, a BSc graduate in Architecture, and Assist. Prof. Semih G. Yıldırım (PhD) in the Department of Architecture, was presented at the “14th ATMK National Lighting Congress” held at the Faculty of Architecture, Istanbul Technical University in November 27-28, 2025. The study was derived from the first author’s completed TÜBITAK 2209A project.

Sustainable design in architecture requires reducing energy consumption and making effective use of natural resources. In this context, daylighting plays a critical role for both user comfort and energy efficiency. This study comparatively analyzes the daylight performance of four vault types with different geometric curvatures (circular, elliptical, parabolic, and cycloid) in combination with skylights. Computer-aided simulations were employed as the method; each vault type was evaluated on three characteristic days of the year (March 21, June 21, and December 21) and at different times of the day. Illuminance levels were classified according to defined threshold ranges, and performance indicators were interpreted based on these values. The findings reveal that the elliptical vault provided the most consistent performance, while parabolic and circular vaults showed higher efficiency during summer months, and the cycloid vault was effective only for limited periods. Overall, all types were insufficient in winter, making artificial lighting support necessary. The study demonstrates that vault geometry is a decisive parameter influencing both light quality and spatial experience.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

Emine Şimşek successfully defended her master's thesis on December 12, 2025, under the supervision of Assist. Prof. Semih G. Yıldırım (PhD), and graduated from the Master's Program in Architecture. The thesis, titled "An Examination of the Types and Properties of Smart Materials Used in the Building Envelope of Office Buildings through Case Analyses," was evaluated by a jury consisting of Prof. Dr. Evren Burak Enginöz (PhD), Assist. Prof. N. Ömer Saatcıoğlu (PhD), and Assist. Prof. Semih G. Yıldırım (PhD).

Today, instead of the traditional approach of materials that merely combat environmental conditions, materials that can meet changing user requirements throughout their lifespan and respond to environmental stimuli are coming to the fore. Smart materials are defined as materials that change their properties by self-actuation in response to physical, chemical, or biological external factors, respond by exchanging energy and matter, and whose behavior can be predicted. While smart materials can be applied in various parts of a structure, the outer shell, which is directly exposed to environmental effects, is one of the areas where these materials are most intensively used. In this context, the selection of smart materials that can adapt to environmental conditions and meet user requirements is important for roofs and facades that form the outer shell. Aiming to improve quality of life, these materials offer significant contributions in areas such as energy savings in the use of office buildings, increased user comfort, optimized heat and light balance, and reduced maintenance and repair costs. Within the scope of the thesis, the first chapter outlines the thesis problem, purpose, scope, method, and limitations. The second chapter addresses the concepts of materials and smart materials; it examines the historical development of smart materials, their areas of application, and classification methods. The third chapter presents the types of smart materials and their properties in detail. The fourth chapter comprehensively analyzes examples of smart materials used in office buildings. Finally, the results obtained from the topics examined and the sample analyses in the study are explained.

NEWS FROM THE FACULTY

ARCHITECTURE

The ARC526 BIM course, offered as part of the Master's Program in Architecture, is taught by Assist. Prof. Semih G. Yıldırım (PhD). As a result of the encouragement provided within the course to support students' academic and professional development, one of the enrolled students, Zahraa Taha, participated in the "Design Together with BIM and Digital Twin" competition organized by the Istanbul Technical University Engineering Preparation Club. According to the competition requirements, teams were expected to be composed of students from the Departments of Architecture, Civil Engineering, and Mechanical Engineering. In line with this requirement, an interdisciplinary team was formed with students from Istanbul Gelisim University, Kultur University, and Yildiz Technical University. The team was named "GKY Trio," inspired by the initials of the participating universities, and was accepted into the competition following the preliminary evaluation process. Subsequently, the team members participated in a four-day foundational training program held at the ITU Faculty of Civil Engineering, Maslak Campus. During this period, they received training on BIM- and Digital Twin–oriented workflows and developed their project roadmaps for the final submission scheduled for March 2026. Student Zahraa Taha, who is enrolled in the ARC526 BIM course, shared the experiences and knowledge gained throughout the competition process with classmates during the course session held on December 23, 2025, highlighting the educational value of this interdisciplinary and practice-oriented experience.

NEWS FROM THE FACULTY

● ARCHITECTURE ●

Filming has begun for the documentary project "Babil'in Asma Bahçeleri," a collaboration between Istanbul Gelisim University (IGU) and Hilla University in Iraq. Focusing on Babylon's historical and cultural heritage, the project aims to highlight not only the archaeological but also the sociological dimensions of the ancient city. As part of this project, Architecture Department faculty member Assoc. Prof. İlke Ciritci conducted interviews on December 26, 2026, regarding Babylon's architecture, building materials, and urbanization.

City and Architecture Seminars 2: Disaster Risk Analysis for the Protection of Cultural Heritage: The Example of Çatalca Ferhat Paşa Mosque. Presented by Senior Engineer Handenur Özdemir, the seminar addressed resilience to disasters and explained how to measure the resilience of the Mimar Sinan Mosque Ferhatpaşa Mosque, a cultural heritage site, to disasters using GIS. The seminar was held in partnership with the Istanbul Studies Application and Research Center (ICUAM) and the Environmental Urban Planning and Geosciences Application and Research Center (CSYBUAM).

FACULTY OF ENGINEERING AND ARCHITECTURE

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

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ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● COMPUTER ENGINEERING ●

Next-Generation Artificial Intelligence–Oriented Chip Architectures Are Accelerating Transformation in Computer Engineering

Prepared by: Research Assistant Hasan YILDIRIM

As of December, a significant development has been observed in the field of computer engineering with a strong focus on artificial intelligence–oriented hardware architectures. Recent studies highlight the emergence of next-generation chip designs in which memory and computation units are integrated in a three-dimensional manner. This architectural approach reduces data transfer distances, minimizes latency, and provides substantial performance improvements for computation-intensive artificial intelligence applications.

It is indicated that the proposed architectural structure offers considerable potential, particularly for large-scale data processing, deep learning, and real-time decision-support systems. The physical and energy-efficiency limitations commonly associated with traditional planar chip designs are largely mitigated through multi-layer integration. Consequently, holistic design approaches that jointly address hardware and software optimization are becoming increasingly prominent within computer engineering research.

This advancement is expected to enable artificial intelligence systems to operate in a faster, more efficient, and more scalable manner, thereby creating new opportunities in application domains such as autonomous systems, intelligent infrastructures, and advanced data analytics. In this context, it is evaluated that the synchronized evolution of hardware architectures and algorithmic innovations will play a critical role in shaping the future of computer engineering

ACTUEL TOPICS IN ENGINEERING AND ARCHITECTURE

● INDUSTRIAL ENGINEERING ●

The Role of Sustainable Supply Chain and Artificial Intelligence in Industrial Engineering

Prepared by: Research Assistant Duygu Tüylü

Industrial engineering is known for producing efficiency and effectiveness-oriented solutions across a wide range of fields, from manufacturing to service systems. In recent years, with the rapid changes in global dynamics, sustainability and digital transformation have become key agenda items for industrial engineering. In particular, sustainable supply chain management aims to optimize environmental, economic, and social performance; and artificial intelligence (AI) technologies stand out as a critical transformative tool in this process.

AI Integration Challenges from an Industrial Engineering Perspective

Of course, AI integration also brings various challenges:

- Data Quality and Reliability: The accuracy of AI models largely depends on the quality of raw data.
- Human-Machine Interaction: Training and adaptation processes are necessary for employees' interaction with AI systems.
- Ethics and Transparency: Transparency and ethical principles in AI decision-making processes must be consistent, especially with sustainability goals.

These challenges require industrial engineers to develop not only technical but also organizational and strategic skills.

Looking to the Future

The development of industrial engineering in the field of sustainable supply chains, together with AI, is critical not only for increasing efficiency but also for building socially and environmentally responsible production systems. In the future:

- Autonomous supply chains,
- Real-time environmental performance optimization,
- Data-driven sustainability certifications and reporting are among the new practices that will be increasingly adopted.

These developments will make not only business performance but also the entire value chain more sustainable and resilient.

● SOFTWARE ENGINEERING ●

Quantum Computers from a Software Engineering Perspective: Current Developments

Prepared by: Research Assistant Sevcan BULUT

Quantum computers are gaining increasing importance in software engineering due to their computational potential that goes beyond classical computing approaches. Principles based on quantum mechanics, such as superposition and entanglement, enable the development of new software approaches, particularly in areas such as optimization, cryptography, and machine learning. By 2025, advancements in quantum hardware have allowed these technologies to be more directly integrated into software development processes.

Leading technology companies are offering quantum processors, as well as programming tools and cloud-based access platforms for software developers. In this context, IBM is expanding its software ecosystem to facilitate testing quantum algorithms, while Microsoft and similar firms are supporting software engineers in conducting experimental work with services that provide remote access to quantum hardware. These developments are making quantum software development independent of costly hardware investments.

The impact of quantum computers on software engineering is not limited to performance improvements. Particularly in the field of software security, it is predicted that classical encryption methods may be insufficient against quantum attacks in the future, bringing post-quantum cryptography research to the forefront. In this context, software engineering faces the need to develop new security and system design approaches that take the quantum age into account.

In conclusion, quantum computers are transforming from an experimental research area to a strategic technology topic for software engineering by 2025. Evolving software tools, hybrid system architectures, and new trends in education indicate that quantum computers will become more visible and influential in software engineering applications in the near future.

FACULTY OF ENGINEERING AND ARCHITECTURE

ACADEMIC AND SCIENTIFIC ACTIVITIES

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ACADEMIC AND SCIENTIFIC ACTIVITIES

● INDUSTRIAL ENGINEERING ●

Dr. Mert Yıldırım, Assistant Professor in the Department of Industrial Engineering at Istanbul IGU, had his paper published in full text in the ISC'25 Proceedings Book

Dr. Mert YILDIRIM, Assistant Professor in the Department of Industrial Engineering at Istanbul Gelisim University's Faculty of Engineering and Architecture, has had his paper titled "Additive Manufacturing Technologies and Materials: A State-of-the-Art Review" published in full in the 5th International Symposium on Characterization (ISC'25) Proceedings Book.

● MECHATRONICS ENGINEERING ●

The paper entitled "CFD-Based Thermal Analysis of Li-ion Battery Module with Different Baffle Configurations and Airflow Conditions" by Assoc. Prof. Dr. Haydar Kepekçi, a faculty member of the Department of Mechatronics Engineering, was presented as an oral paper at the 5th International World Energy Congress, hosted by Erciyes University in Kayseri, held on December 12–13, 2025.

The project titled "Investigation of the Mechanical Properties of Single-Lap Adhesive Joints of Layered Hybrid Biocomposites", coordinated by Assoc. Prof. Engin Erbayrak and carried out with the participation of Assist. Prof. Seda Erbayrak and Res. Asst. Tunay Acıman, has received funding approval from the Scientific Research Projects Commission of Istanbul Gelisim University

ACADEMIC AND SCIENTIFIC ACTIVITIES

● MECHATRONICS ENGINEERING ●

Dr. Kenan Şentürk, a faculty member from our department, has been appointed as the Quality Coordinator of our university.

ACADEMIC AND SCIENTIFIC ACTIVITIES

● ELECTRICAL ELECTRONICS ENGINEERING ●

Dr. Lecturer Member Nevzat Yağız Tombal has been appointed as the Head of the Department of Electrical and Electronics Engineering. We wish him success in his new position and would like to thank him in advance for the contributions he will make to our department

International Publication Achievement of Istanbul Gelişim University Academic, Prof. Dr. Bayram ÜNAL

The scientific article entitled “Correlating Microstructure and Electrical Properties: The Role of Lanthanum Doping in Mn-Ni Nanospinel Ferrites” by Prof. Dr. Bayram ÜNAL, Dean of the Faculty of Engineering and Architecture and faculty member of the Department of Electrical and Electronics Engineering, has been published in Materials Chemistry and Physics, one of the prestigious international journals in the field.

We congratulate Prof. Dr. Bayram ÜNAL on this study, which makes a valuable contribution to the international literature, and wish him continued success in his academic endeavors.

https://doi.org/10.1016/j.matchemphys.2025.131929

International Publication Achievement of Istanbul Gelişim University Academic, Prof. Dr. Bayram ÜNAL

The scientific article entitled “Defect-engineered charge transport and dielectric relaxation in In/Se co-substituted CoNi spinel ferrite nanoparticles by sonochemical route” by Prof. Dr. Bayram ÜNAL, Dean of the Faculty of Engineering and Architecture and faculty member of the Department of Electrical and Electronics Engineering, has been published in Materials Science and Engineering, a prestigious international journal.

We congratulate Prof. Dr. Bayram ÜNAL on this valuable study contributing to the international scientific community and wish him continued success.

https://doi.org/10.1016/j.mseb.2025.119138

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

New Article Published by Department Chair Asst. Prof. Ahmad Reshad NOORI

Asst. Prof. Ahmad Reshad NOORI, Chair of the Civil Engineering Department at the Faculty of Engineering and Architecture, Istanbul Gelişim University, has published a new research article co-authored with his PhD student Marwan Abdulkareem Shakir ALBAYATI, titled “Multi-Algorithm Optimization and Dimensional Assessment of Steel Castellated Beams with Sinusoidal Web Openings Subjected to Static Loads.”

The study proposes an innovative multi-algorithmic optimization framework for the optimal design of sinusoidal castellated steel beams, which are increasingly used in modern steel structures. The model evaluates five different beam lengths (300–700 cm) using five metaheuristic algorithms: Cyclical Parthenogenesis Algorithm (CPA), Improved Ray Optimization (IRO), Tug of War Optimization (TWO), Vibrating Particles System (VPS), and Imperialist Competitive Algorithm (ICA). The algorithms were compared based on four key performance criteria: construction cost, processing time, dimensional consistency, and solution stability. The results indicated that CPA and TWO achieved the most dimensionally consistent and cost-effective solutions, while VPS provided the most economical outcomes for longer spans. As one of the first comprehensive multi-criteria optimization studies on sinusoidal castellated beams, this research offers valuable insights for structural engineers seeking efficient and stable design configurations.

The department congratulates Asst. Prof. Ahmad Reshad NOORI and his PhD student Marwan Abdulkareem Shakir ALBAYATI for their achievement and wishes them continued success in their academic endeavors.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

TUBITAK 1002-A Project by Our Faculty Member Approved

The project proposal submitted by Asst. Prof. Mustafa Yurdabal APAK from the Civil Engineering Department under the TUBITAK 1002 - A Rapid Support Programme has been approved for funding.

The project titled “Sustainable Pavement Technology: Reducing Freezing Delay and Ice-Related Accidents in Asphalt Concrete Using Expanded Vermiculite” successfully passed the scientific evaluation process conducted by TUBITAK. The study aims to develop innovative and sustainable solutions to mitigate the adverse effects of winter conditions on road pavements.

The project is expected to contribute to reducing traffic accidents caused by freezing and icing while offering practical applications for asphalt pavement technologies.

The department congratulates Asst. Prof. Mustafa Yurdabal APAK on this significant achievement and wishes him continued success in his research activities.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

Patent Application Involving Our Faculty Member Accepted by the US Patent Office

The patent application involving Asst. Prof. Dr. Mesut BARIŞ, a faculty member of the Civil Engineering Department, has been officially accepted by the United States Patent and Trademark Office (US Patent). The study was also carried out with the contribution of Prof. Dr. Mustafa TOMBUL and Prof. Dr. Ali Savaş KOPARAL.

The patent, titled “Multilayer Panel Comprising Biofilm to Reduce Evaporation in Dams” focuses on an innovative panel system designed to reduce evaporation losses in dam reservoirs while enabling biomass production. The biofilm-based panel generally consists of three main layers: a support layer, a nutrient layer, and a biofilm layer. Depending on the climatic conditions of the dam location, an additional heat storage intermediate layer may also be included.

The developed panel is positioned to partially cover the water surface, aiming to minimize evaporation losses and offering a sustainable solution for water resource management.

The department congratulates Asst. Prof. Dr. Mesut BARIŞ and all contributing researchers on this significant achievement and wishes them continued success in their scientific and technological endeavors.

BAP Project by Our Faculty Member Approved

İThe Scientific Research Project (BAP) titled “The Impact of Mathematical Simulation Tools on Academic Practices: A PLS-SEM Approach,” led by Asst. Prof. Sajedeh NOROZPOUR from the Civil Engineering Department, has been approved.

The project aims to investigate the impact of mathematical simulation tools on academic practices using a statistical approach based on Partial Least Squares Structural Equation Modeling. The study is expected to provide valuable insights into the evaluation and improvement of academic processes.

The department congratulates Asst. Prof. Sajedeh NOROZPOUR on this achievement and wishes her continued success in her scientific research.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

New Article on Emergency Service Optimization Published by Our Faculty Member

The article titled “Mathematical Modeling and Numerical Analysis for Optimizing Ambulance Allocation in Emergency Services,” authored by Asst. Prof. Sajedeh NOROZPOUR from the Civil Engineering Department, has been published.

The study investigates the optimization of ambulance locations to improve overall system coverage in emergency services through mathematical modeling. Response time is analyzed by considering pre-travel delays and actual travel time, which are modeled using normal and exponential distributions. A differential equation approach is employed to examine the proportion of emergency calls reached within a given time threshold, and solutions are obtained using the finite difference method.

In addition, an iterative numerical technique is applied to maximize expected coverage by efficiently allocating ambulances across different districts. The results demonstrate notable trends in coverage performance depending on allocation strategies, highlighting the effectiveness of the proposed model. The study provides a comprehensive framework for evaluating and improving emergency response systems, offering valuable insights for public health and safety.

Our department congratulates Asst. Prof. Sajedeh NOROZPOUR on this valuable academic work and wishes her continued success in her scientific endeavors.

Conference Paper by Our Faculty Members and Students Presented at an International Conference

The conference paper titled “Statistical Analysis and Examination of Long-Term Precipitation in the Ceyhan Basin,” authored by Asst. Prof. Yasin PAŞA from the Civil Engineering Department, PhD student Zaid Al QAZZAZ, and MSc student Rojgül DEMİREL, was presented at the 5th International Conference on Trends in Advanced Research.

The study focuses on the statistical analysis of long-term precipitation data from the Ceyhan Basin, examining rainfall trends and variability over time. The findings are considered valuable for hydrological studies, water resources management, and understanding the impacts of climate change.

The department congratulates our faculty member and students for representing the department at an international scientific platform and wishes them continued success in their academic work.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

Conference Paper on the MRB Constant Published by Our Faculty Member

The conference paper titled “Introducing the MRB Constant: Convergence, Geometry, and Open Problems,” authored by Asst. Prof. Sajedeh NOROZPOUR from the Civil Engineering Department, has been published within the scope of the INTERNATIONAL 10th USBILIM APPLIED SCIENCES CONGRESS.

The study examines the convergence properties of a power series whose terms can be expressed as the nth root of n, from which the MRB constant arises through an alternating summation. Although this expression approaches one as the value of n increases, its non-uniform behavior plays a key role in the convergence characteristics of the series. The paper discusses conditions of uniform convergence to ensure analytical validity, presents geometric interpretations, and highlights open problems related to the proposed constant.

This work offers an original contribution to mathematical analysis and applied sciences by providing new insights into convergence behavior. Our department congratulates Asst. Prof. Sajedeh NOROZPOUR for this academic contribution.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

Article on Dam Failure Peak Discharge Estimation Accepted for Publication

The article titled “Development of Novel Simplified Empirical Equations for the Estimation of Peak Discharge due to Dam Failures,” authored by Asst. Prof. Yasin PAŞA from the Civil Engineering Department, has been accepted for publication in the journal Water Resources Management.

The study proposes a novel methodology for estimating peak discharge resulting from earth-fill dam failures through the development of simplified empirical equations. The approach integrates numerical simulations, parametric sensitivity analyses, and meta-heuristic optimization techniques. The historical failure of the Teton Dam in the USA was selected as a reference case due to the availability of reliable data.

Based on extensive simulations, the most influential breach parameters were identified and used to develop a new family of empirical equations named SEED (Simplified Empirical Equation for Dam Failure). The proposed framework offers a rapid and flexible tool for dam breach risk assessment, early warning systems, and emergency action planning, particularly in time-critical or data-limited scenarios.

The department congratulates Asst. Prof. Yasin PAŞA on this significant academic achievement and wishes him continued success in his research activities.

ACADEMIC AND SCIENTIFIC ACTIVITIES

CIVIL ENGINEERING

Article on the Ünye Cevizdere Flood Disaster Published by Our Department Technician

The article titled “Investigation of Ünye Cevizdere flood disaster with flood inundation and hazard maps,” authored by Abdülbaki HACI, MSc, a technician of the Civil Engineering Department, has been published in the Journal of the Faculty of Engineering and Architecture of Gazi University.

The study examines the flood event that occurred in Ünye Cevizdere on 8 August 2018 using comprehensive hydrological and hydraulic modeling approaches. Watershed delineation and rainfall–runoff simulations were conducted and calibrated with observed data. Two-dimensional hydraulic modeling was then used to determine flood inundation areas and to produce flood hazard maps for different return periods.

In addition, scenarios representing the existing stream conditions were compared with alternative scenarios including flood walls and stream restoration measures. The results provide valuable insights into the effectiveness of structural interventions in reducing flood impacts and support flood risk assessment and mitigation planning.

The department congratulates Abdülbaki HACI on this publication and wishes him continued success in his professional and academic work.

ACADEMIC AND SCIENTIFIC ACTIVITIES

ARCHITECTURE

The article entitled "Alteration of office space to design studio for tertiary education; Daylighting impact", authored by Assist. Prof. Semih G. Yıldırım (PhD) from the Department of Architecture, has been published in the journal of "NEW DESIGN IDEAS".

This study investigates the challenge of converting office buildings into educational spaces, focusing on the higher daylight requirements of design studios (500 lux) compared to offices (300 lux). It evaluates natural daylight performance in a repurposed high-rise building adapted for design education. The primary goal is to assess daylight adequacy on repurposed floors, examining the impact of increased illuminance thresholds. Using Autodesk Revit's simulation tools, the study applies three metrics —Daylight Factor (DF), Spatial Daylight Autonomy (sDA), and point-in-time illuminance—to floors in a university building in Istanbul. Due to software limitations, illuminance analysis was prioritized for detailed evaluation. Two floors with identical exteriors but differing interiors—a subdivided 12th floor with five studios and an open-plan 15th floor—were compared. Simulations reveal that interior partitions reduce daylight uniformity and compliance. Raising the threshold to 500 lux decreases overall daylight compliance; spaces with favorable orientation and shallow depth performed better, while deeper or centrally located areas required more artificial lighting. Afternoon glare risk was highest in the best-performing zone, highlighting the influence of orientation and layout. Only a limited number of classrooms achieved daylight standards under the stricter threshold. The findings emphasize the critical role of spatial configuration and software constraints in daylighting performance, underscoring the need for adaptive design strategies and glare control in repurposed educational environments.

ACADEMIC AND SCIENTIFIC ACTIVITIES

ARCHITECTURE

A recent article by Assoc. Prof. İlke Ciritci, a faculty member of the Department of Architecture, has been published in the Scopus-indexed journal, Journal of Ottoman Heritage Studies. Titled "Re-functionalization of Cultural Heritage Buildings in Iskenderun: Evaluation of the Potential of the Former British Consulate Building," the article emphasizes the need for the re-functionalization of the former consulate building in Iskenderun.

The damage sustained, particularly after the earthquakes of February 6, 2023, and the fire in 2024, highlights the urgency of preserving and re-functionalizing the building. The research concludes that evaluating the building with functions that are compatible with its cultural heritage identity and serve public benefit (museum, cultural center, library, etc.) will contribute both to the preservation of the city's memory and to Iskenderun's cultural tourism. The article can be accessed via the following link: https://osmanlimirasi.net/index.php/omad/article/view/392/348

Asst. Prof. Dr. Oluwagbemiga Paul Agboola of the Department of Architecture, published a manuscript entitled ‘Comparative Assessment of Climate-Responsive Design and Occupant Behaviour Across Türkiye’s Building Typologies for Enhanced Utilisation and Performance’ in ‘Building’ (ISSN 2075-5309). Volume: 16; Issue: (1), Page: 18. Indexed in SCIE (Web of Science); and Scopus. Published: 19 December 2025. The manuscript could be accessed via the links: https://doi.org/10.3390/buildings16010018 & https://www.mdpi.com/2075-5309/16/1/18

About the publication:

This study investigates the sustainability performance of selected historic, commercial, and institutional buildings in Istanbul, with the aim of identifying effective climate-responsive and energy-efficient design strategies. Using LEED-based evaluation criteria. The results reveal clear performance differences across building typologies. Overall, the findings underscore the complementary value of combining traditional passive strategies with modern smart technologies to achieve resilient, low-energy, and user-responsive architecture. This study is novel as it uniquely demonstrates how traditional passive design strategies and modern smart technologies can be integrated to enhance climate-responsive and energy-efficient performance across diverse building typologies. The study recommends enhanced indoor air quality strategies, occupant education on system use, and stronger policy alignment with LEED standards.

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