



**KARADENİZ
TEKNİK ÜNİVERSİTESİ**
KARADENİZ TECHNICAL UNIVERSITY
1955

METALLURGICAL AND MATERIALS ENGINEERING



A message from fead of Department

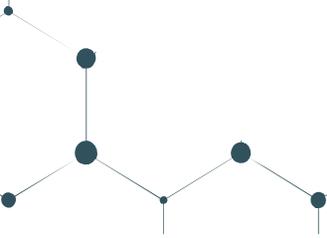
Since the existence of mankind, he met the materials (copper, bronze, iron) that gave their names to the ages to maintain his life and tried to use these materials to meet his daily needs. Metallurgical and Materials engineering department constitutes one of the most important fundamental and disciplinary fields of human life. The world's advances in science and technology have been with the development of new materials. Metallurgical and Materials Engineering is the department that develops useful engineering solutions in its field with a multi-disciplinary approach and associates it with basic sciences. It consists of studies to understand the production, structure, composition, and properties of materials, to develop innovative materials based on these properties, and to reveal efficient and sustainable alternatives.

Metallurgical and Materials Engineering is a contemporary science that aims to design, develop, and produce new materials that will increase the quality of life of humanity, and to create new areas of use for existing materials. Today, metallurgy and materials engineering; from transportation to environment, electrical-electronics industry, telecommunications, construction industry, defense industry, three-dimensional printer technology, aerospace industry, biomaterials and biomedicine, automobile industry, health and energy sector, in harmony with the efficiency, energy and raw material trio. Since its graduates are equipped with advanced knowledge and technology, they try to change the world by introducing new generation functional materials. Metallurgical and Materials Engineering, which is involved in every application area imaginable, can be a Production Engineer, Quality Control Engineer, Research and Development (R&D) Engineer, Project Engineer, Sales Engineer, Product Development Engineer, etc. in these sectors. could work in management positions.

The Metallurgical and Materials Engineering Program has been developing continuously since its establishment and continuously improves both its educational and academic infrastructure. Important steps have also been taken to increase the quality of undergraduate and graduate education by continuously improving research and development (R&D) studies and academic staff. Students are offered opportunities to take part in national and international projects and participate in exchange programs. Students are given full support by the department and instructors in terms of both project writing and management in applying to TUBITAK undergraduate projects. Many TUBITAK projects have been accepted and the number of projects is increasing day by day. To contribute to the development of our students in technical and social fields, it is among the goals of effectively benefiting from national and international student exchange programs such as Farabi, Mevlana and Erasmus.

Dear students: we invite you to join our department to receive a modern and advanced engineering education, to share the knowledge, experience, problems and successes of our industrialists and businessmen with us, to benefit from the laboratories of the department developed, to cooperate with our large and competent academic staff, and to create synergy with our energy.

Prof. Dr. Aykut ÇANAKÇI





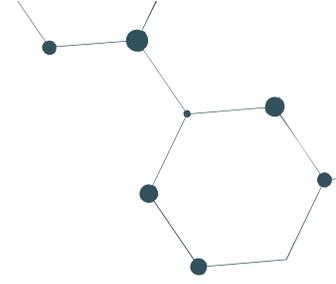
About Us

The Metallurgical and Materials Engineering was established in 2003 under the chairmanship of Prof. Dr. Fazlı ARSLAN and started its teaching activities in the 2006-2007 academic year. The Metallurgical and Materials Engineering Program, which started its educational and scientific activities under the roof of five departments, namely Materials Science, Metallurgy, Ceramic Materials, Composite Materials and Polymer Science and Technology, has been to continuously improve both education-research and development infrastructure.

The Metallurgical and Materials Engineering Program, which started its educational activities with a very limited academic staff, made important progress in the process, and the faculty members (Metallurgy and Materials, Machinery, Manufacturing, Physics and Chemistry) who were currently educated in different disciplines could come together to create joint projects, it has reached an academic staff that can bring different perspectives and goals.

The Department of Metallurgical and Materials Engineering has 6 professors, 3 associate professors, 1 doctoral faculty member, 11 research assistants, 3 technicians and 2 administrative staff. The Metallurgical and Materials Engineering Program has been developing continuously since its establishment and continuously improves both its educational and academic infrastructure.





While the Metallurgical and Materials Engineering Program had very few experimental and research equipment such as optical microscopes, metallography and mechanical test equipment at the time of its establishment, it has now reached a wide range of research equipment infrastructure including optical microscopes, tribology test equipment, particle size measurement equipment, mechanical test equipment (tensile-macro hardness-microhardness), sintering and heat treatment units, powder densification presses (cold and hot densification), high-energy grinders and thermal analysis devices.

The Department of Metallurgical and Materials Engineering had its first alumni in 2009-2010 academic year and since then our alumni have started to work as Metallurgical and Materials Engineers in industrial organizations.



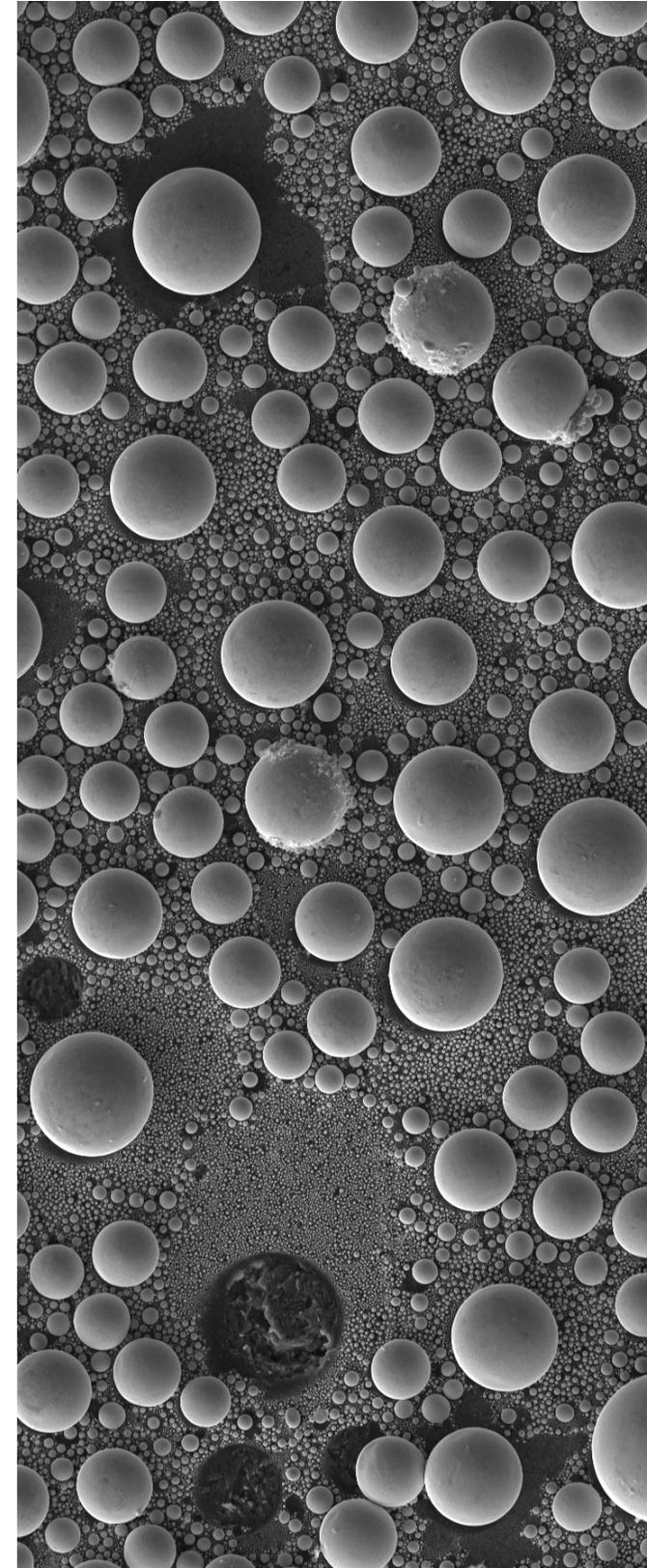
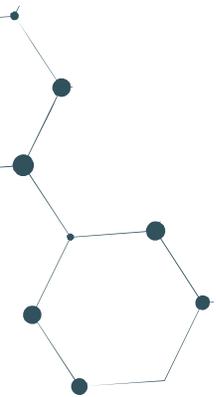


Program Objectives

The mission of KTU Metallurgical and Materials Engineering Department is to carry out educational programs to train high quality engineers with a strong background in materials related scientific and engineering problem solving methods, nationally and internationally recognized.

The career goals that KTU Metallurgical and Materials Engineering Undergraduate Program graduates are expected to reach soon areas follows:

- Have sufficient know-how to work as Engineers, Researchers and Managers in the fields of casting, ceramic, composite, plastic forming, heat treatment, machining, welding, material inspection, coating and quality control in public institutions and industrial organizations,
- To take responsibilities for the design, operation, improvement, and new product development of metallurgical and materials related systems in priority areas such as advanced and traditional materials technologies, materials products and process development, manufacturing, defense, health, energy, and transportation,
- To pursue a postgraduate education and academic career in the field.

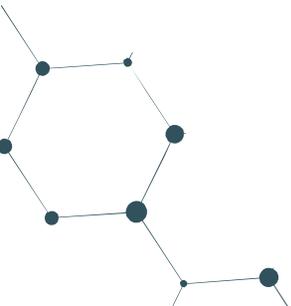




Undergraduate Studies

The Department of Metallurgy and Materials Engineering is concerned with the production and application of knowledge related to engineering materials. It includes processes such as extraction and refining, synthesis and processing of materials, factors affecting the internal structure of solids, methods for altering the structure and properties of materials, and factors affecting material behavior in service. Materials innovations are important in all other engineering fields, as they often lead to improvements in design or sometimes even the emergence of entirely new products.

Metallurgy and Materials Engineering encompasses the design, development, production, and adaptation of metal, ceramic, polymer, and composite-based engineering materials ranging from nano to macro dimensions, starting from natural or artificial raw materials of inorganic or organic origin. These materials' acquired properties are tailored to various technical needs in various industrial sectors.



Course Contents

MET1001 Engineering Drawing

This course aims to provide students with the skillset to create technical drawing using a technical language that is internationally recognized among engineers and ensures the connection between design and manufacturing. Students will also learn how to read and interpret existing technical drawings.

MET1005 Introduction to Metallurgy and Materials Engineering

This course is designed to introduce new students to the profession of Metallurgy and Materials Engineering, its areas of work, and to familiarize them with the program and department of Metallurgy and Materials Engineering at KTU. The course aims to increase students' motivation and interest in the field.

MET1000 Computer Programming

This course aims to develop the logic of structural programming, teach the most used C++ commands, provide coding solutions for engineering problems using C++, and help students understand the concepts of C++ object-oriented programming.

MET1002 Computer-Assisted Engineering Drawing

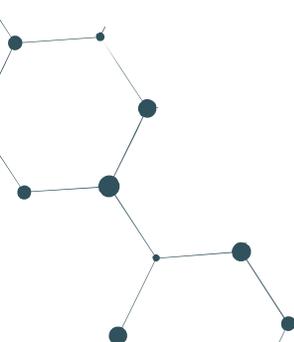
This course aims to provide students with the skillset to create technical drawing using a technical language that is internationally recognized among engineers and ensures the connection between design and manufacturing. Additionally, students will learn how to use the solid modeling technique to produce more efficient and faster solutions in places where flexible production is important in design and manufacturing.



Undergraduate Studies

The undergraduate education program emphasizes the fundamental principles for all these material classes. The undergraduate education, which provides basic knowledge of physics, chemistry, and mathematics in the early years, includes education in later years that provides the necessary knowledge for becoming a Metallurgical and Materials Engineer and helps the engineering candidate determine their career goals.

As a result of the education provided, Metallurgical and Materials Engineers can advance their careers in many fields such as metal, ceramic, polymer, semiconductor, coating, defense, machinery manufacturing, automotive and automotive ancillary, aircraft and ship manufacturing, metal shaping and processing industry, electrical-electronic material production, welding material production, magnetic material production, biomedical material production, quality control and inspection companies, and non-destructive testing.



MET2003 Statics and Strength of Materials

Learning the basic concepts and principles for analyzing forces applied on stationary rigid bodies and deformable bodies and obtaining the magnitude of stress and deformation in bodies under external loads.

MET2005 Business Ethics

Creating awareness of ethical problems that engineers may encounter in their professional careers, introducing internationally accepted engineering ethics codes, teaching decision-making mechanisms for scientific, professional, and business ethics issues, and making engineers aware of their ethical responsibilities through sample problems.

MET2009 Materials Science-1

Knowing the basic types of materials, understanding crystal lattice structures and how they affect the properties of metals and alloys, understanding crystal lattice defects in materials and their effects on material properties, learning the mechanical properties of materials such as hardness, tensile strength, yield strength, toughness, ductility, impact strength, fatigue and creep properties, and learning the basic concepts of phase diagrams and non-destructive measurement methods.

MET2015 Thermodynamics of Metallurgy

Developing the ability to apply the basic principles of thermodynamics to metallurgy problems and teaching students the basic concepts of thermodynamics in metallurgy.



Undergraduate Studies

1st Semester		
AITB1003	Ataturk's Principles and History of Revolution-1	2+0+0
FIZ1001	Physics-1	3+0+1
KIM1010	Basic Chemistry	3+0+1
MAT1011	Math-1	4+0+0
MET1001	Engineering Drawing	2+1+0
MET1005	Introduction to Metallurgical and Materials Engineering	2+0+0
TDB1005	Turkish Language-1	2+0+0
YDB1001	English-1	3+0+0

2. Semester		
AITB1004	Ataturk's Principles and History of Revolution-2	2+0+0
FIZ1002	Physics-2	3+0+1
KIM1008	Physicalchemistry	3+0+0
MAT1008	Math-2	4+0+0
MET1000	Computer Programming	2+1+0
MET1002	Computer Aided Engineering Drawing	2+1+0
TDB1004	Turkish Language-2	2+0+0
YDB1002	English-2	3+0+0

3rd Semester		
MAT2011	Differential equations	4+0+0
MET2003	Static and Strength	3+0+0
MET2005	Professional Ethics	2+0+0
MET2009	Materials Science-1	3+0+0
MET2015	Metallurgical Thermodynamics	3+0+0
Technical Elective		
MET2011	Analytical chemistry	3+0+0
MET2017	Inorganic Chemistry	3+0+0

Course Contents

MET2011 Analytical Chemistry

To teach the basic principles of qualitative and quantitative analysis, to give students basic information about gravimetric and volumetric analysis methods and applications.

MET2017 Inorganic Chemistry

Teaching the basic concepts in inorganic chemistry, comprehending intramolecular and intermolecular chemical bonds and interactions, teaching I A, II A and III A group metals, their properties, compounds and usage areas, teaching B group metals, their properties, compounds and usage areas, To comprehend metallic materials, toxic effects of metals and metallurgical processes.

MET2002 Phase Diagrams

Teaching students the concept of phase equilibrium and related basic principles, which are essential for metallurgical and materials engineers.

MET2004 Probability and Statistics

Teaching the basic elements of statistics and probability, methods of describing data sets with graphical and numerical methods, and probability and statistics used in modeling engineering problems.

MET2008 Transport Events

To teach students the basic laws of thermodynamics, fluid mechanics and heat transfer, and to make them understand how these laws can be applied to metallurgical and materials engineering problems.

MET2012 Materials Science-2

To learn the kinetics of phase transformations theoretically and to make calculations about it, to teach what the electrical, magnetic, and thermal properties of materials are.



Undergraduate Studies

4. Semester		
MET2002	Phase Diagrams	3+0+0
MET2004	Probability and Statistics	3+0+0
MET2008	Transport Events	3+0+0
MET2012	Materials Science-2	3+0+0
MET2014	Solutions Thermodynamics	3+0+0
Technical Elective		
MET2000	Electrochemistry	3+0+0
MET2018	Organic chemistry	3+0+0

5. Semester		
MET3003	Chemical Metallurgy	3+0+0
MET3005	Material Characterization	3+0+0
MET3009	Casting Principles and Technology	3+0+0
MET3011	Physical Metallurgy	3+0+0
MET3027	Professional English	3+0+0
Technical Elective		
MET3017	Non-Destructive Material Inspection	3+0+0
MET3025	Introduction to Biomaterials	3+0+0
Social Elective		
USEC0011	Career planning	2+0+0
MET3015	Business law	2+0+0
MET3019	entrepreneurship	2+0+0
USEC0005	General Sociology	2+0+0

Course Contents

MET2014 Solution Thermodynamics

To teach thermodynamic concepts and basic relations, to teach thermodynamic calculations for solutions in different environments, to teach basic concepts of binary phase diagrams, to teach thermodynamic behavior in solutions containing more than one dilute solution, to teach selection and design criteria in processes involving solutions.

MET2000 Electrochemistry

To give information about the basic principles and laws of electrochemistry.

MET2018 Organic Chemistry

To recognize functional groups in organic chemistry and to have knowledge about their interactions with each other.

MET3003 Chemical Metallurgy

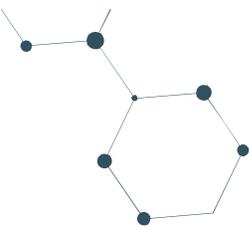
To teach the student the principles of ore preparation, metal production, refining, thermodynamics, and kinetics.

MET3005 Material Characterization

To provide a comprehensive and practical understanding of the methods of characterization of materials.

MET3009 Casting Principles and Technology

To teach casting methods, casting mold design principles and calculations, to explain the problems that may arise during the solidification of castings and to solve them, to introduce the tools and equipment used in foundry.





Undergraduate Studies

6. Semester		
MET3000	Ceramics	3+0+0
MET3010	Metallurgy and Materials Laboratory-1	1+0+2
MET3024	Polymeric Materials	3+0+0
MET3026	Mechanical Behaviour of Materials	3+0+0
MET3028	Design and Material Selection	3+0+0
Technical Elective		
MET3034	Iron-Steel Production	3+0+0
MET3020	Surface Treatment	3+0+0
Social Elective		
MET3002	Scientific Project Writing Procedures and Principles	2+0+0
MET3030	Occupational Health and Safety	2+0+0
USEC0010	Project Management	2+0+0

7. Semester		
MET4000	Graduation Project	2+2+0
MET4011	Graduation Design Project	2+2+0
MET4021	Occupational Experience -1	0+2+0
MET4007	Metallurgy and Materials Laboratory-2	1+0+2
MET4037	Metal Forming	3+0+0
Technical Elective		
MET4005	Recycling of Waste Materials	3+0+0
MET4013	Nano Materials and Nano Technology	3+0+0
MET4029	Welding Metallurgy and Technology	3+0+0
MET4035	Heat Storing Materials	3+0+0
MET4027	Corrosion	3+0+0
MET4025	Machine Tools and Technology	3+0+0

Course Content

MET3011 Physical Metallurgy

Physical metallurgy, the relationships between the composition, structure and properties of metals and alloys, and to provide students with the ability to bridge the gap between basic material rules and practical applications.

MET3027 Technical English

To develop the ability to read and understand technical parts in the field of Metallurgical and Materials Engineering. To develop technical vocabulary. To develop the ability to write technical terms and definitions. To develop the ability to understand common grammar and structures in technical English.

MET3017 Non-Destructive Material Testing

To give information about non-destructive material testing and to help students to choose the most appropriate method for non-destructive testing methods.

MET3025 Biomaterials

To transfer the necessary information about the types and properties of materials used as biomaterials, tissue-material relations, simulated environments, and animal studies. To provide students with interdisciplinary knowledge by giving information about soft and hard tissue engineering applications of biodegradable and non-degradable polymers and drug release studies.

MET3019 Entrepreneurship

To disseminate the entrepreneurship culture and to ensure the establishment of successful businesses by introducing entrepreneurial students to the concept of business plan. At the end of the training, to provide entrepreneur candidate students with the knowledge and experience to prepare business plans for their own business ideas.



Undergraduate Education

8. Semester		
MET4000	Graduation Project	2+2+0
MET4004	Occupational Experience -2	0+2+0
Technical Elective		
MET4022	Powder Metallurgy	3+0+0
MET4032	Kinetics of Metallurgical Processes	3+0+0
MET4030	Composite Materials	3+0+0
MET4006	Measurement Technique	3+0+0
MET4012	Failure Analysis	3+0+0
MET4028	Advanced Engineering Materials	3+0+0
MET4014	Tribology	3+0+0

Course Content

MET3015 Business Law

To prepare students for working life.

MET3000 Ceramic Materials

To learn ceramic materials and their classification, to have knowledge about the crystal structures of ceramic materials, to understand the production and production methods of ceramic materials, to have knowledge about traditional and advanced technology ceramics, to have knowledge about glass structure and properties, to have knowledge about the preparation of ceramic glazes and glaze formulation, to have knowledge about the mechanical properties of ceramic materials.

MET3010 Metallurgy and Materials Laboratory-1

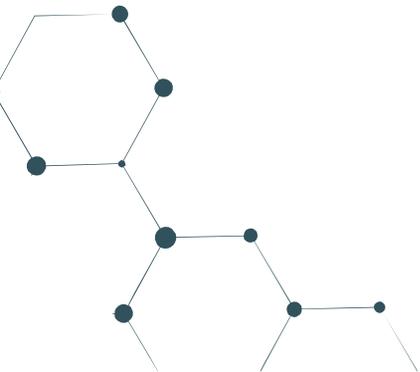
To give the opportunity to apply the theoretically learnt information. To make practical training on the properties and characterization of materials.

MET3024 Polymeric Materials

To introduce the principles of polymer science, to introduce production technologies associated with polymer products, to introduce test methods for polymers.

MET3026 Mechanical Behavior of Materials

The aim of this course is to teach the principles and principles of deformation mechanisms, dislocation theory, strength increasing methods and mechanical behavior of materials such as fatigue, creep and fracture.





Laboratories

Heat Treatment Laboratory

Heat treatment furnace, drying oven, hot press, tube sintering furnace, vacuum furnace with elevator.

Novel Alloys Design and Development Laboratory

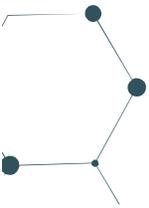
High-energy ball mill, ultrasonic cleaning device, particle size measurement device, sample moisture measurement device, contact material testing apparatus, precision balance, brush material testing apparatus, sieve, fume hood, wear testing apparatus.

Powder Metallurgy Laboratory

Hydraulic press, hort-arm hydraulic press, single-axis double-acting hydraulic press, powder mixing unit.

Production Metallurgy Laboratory

Thermal analysis device, centrifuge, cryogenic grinding, precision balance, drying oven, ball mill. electric melting pot, distilled water production device, arc melting.





Laboratories

Metallography Laboratory

Binocular microscope, fume hood, manual grinding unit, hot sample molding device, ultrasonic mixer, sample cutting device, semi-automatic grinding and polishing device, automatic grinding and polishing device.

Mechanical Testing Laboratory

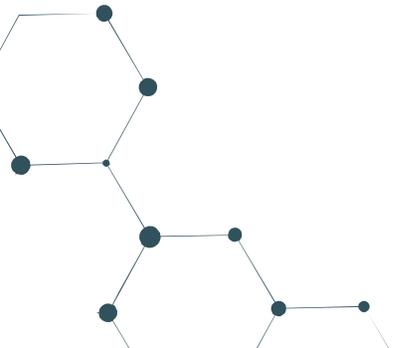
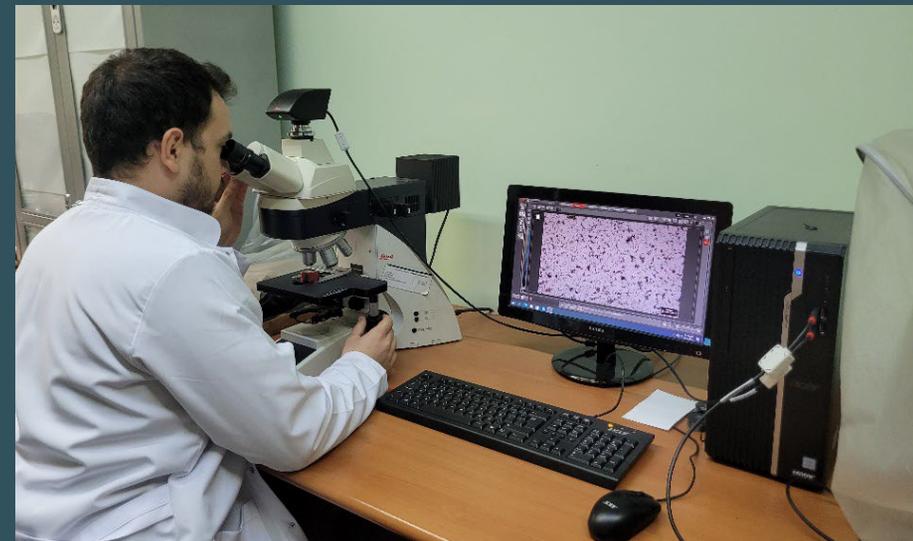
Tube furnace, powder sieving unit, friction coefficient measurement device, sample cutting device, reduction furnace, hydraulic press, rolling mill, brake pad testing device, tensile testing machine, notch impact tester.

Machine Tools Laboratory

Electric cutting machine, electric saw, hydraulic saw, MIG welding unit, oxy-acetylene welding kit, sheet bending tool, pillar drill, grinding and brushing, metal cutting shears, spot welding unit.

Surface Treatment Laboratory

Fume hood, deep freezer, electrolysis experimental setup, precision balance, magnetic stirrer, pH meter, homogenizer, ultrasonic bath, distilled water production device.





Laboratories

Hardness Testing Laboratory

Trinocular microscope, digital Rockwell hardness tester, digital microhardness tester, Brinell hardness tester.

Composite Production Laboratory

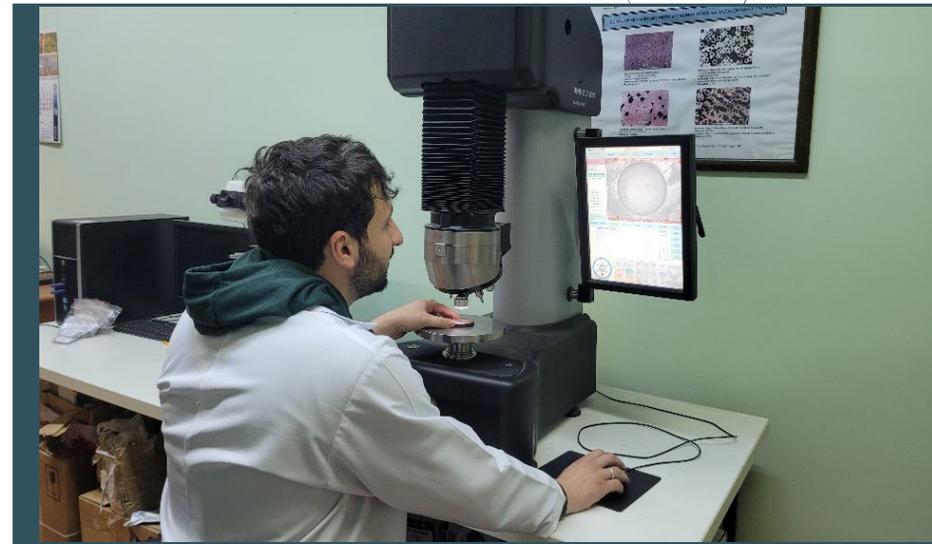
Production of particle and fiber reinforced structural composites, composite production by extrusion and injection methods.

3D Design and Production Laboratory

Reversible engineering applications, 3D prototype production, 3D quality control, 3D photogrammetric scanning.

Thermal Analysis Laboratory

Differential scanning calorimeter device, thermal conductivity measuring device, heating-cooling baths and melting-solidification time measuring device.





Academic Staff



Prof. Dr. Ümit Alver

Doctorate: Louisiana State University and Agricultural and Mechanical College, Physics, United States of America

Masters (Non-Thesis): Old Dominion University, Physics, United States Of America

Postgraduate: Karadeniz Technical University, Physics, Turkey

Undergraduate: Karadeniz Technical University, physics teaching department, Turkey

Research Areas

Material science and engineering, Composites, Polymeric Materials, Nanomaterials, Physics, Condensed Matter 1: Structural, Mechanical and Thermal Properties, Surfaces, Interfaces, Thin Films and Nano systems, Electronic Structure, Electric, Magnetic and Optical Properties, Electrical properties of electronic structures, interfaces, thin films and low-dimensional structures

❖ Publications

- ❖ Khalid, F., Saleem, M., Jabbar, H., Tanvir, M. G., Butt, M. S., Baluch, A. H., & Khan, M. Z. (2022). Improved super capacitive performance of hydrothermally developed Mn and Ni oxides along with activated carbon as ternary nanocomposite. *Journal of Physics and Chemistry of Solids*, 161, 110467.
- ❖ Güler, O., Varol, T., Alver, Ü., Kaya, G., & Yıldız, F. (2021). Microstructure and wear characterization of Al₂O₃ reinforced silver coated copper matrix composites by electroless plating and hot pressing methods. *Materials Today Communications*, 27, 102205.
- ❖ Erdemir, F., Tuzcu, E., Bilgin, S., Alver, Ü., & Çanakçı, A. (2021). Influence of fluorine doping of zinc oxide on its electrochemical performance in supercapacitors. *Materials Chemistry and Physics*, 259, 124033.



Prof. Dr. Hamdullah Çuvalcı

Doctorate: Karadeniz Technical University, Engineering Faculty, Mechanical Engineering, Turkey, 2006

Postgraduate: Karadeniz Technical University, Engineering Faculty, Mechanical Engineering, Turkey, 1989

Undergraduate: Karadeniz Technical University, Engineering Faculty, Mechanical Engineering, Turkey, 1986

Research Areas

Metallurgical and Materials Engineering, Material science and engineering, Material Characterization, Engineering and Technology

❖ Publications

- ❖ Kocaman, M., Çuvalcı, H., & Güler, O. (2022). Novel Flame-retarded Novolac Matrix Hybrid Composites with Graphite Particles and Glass Fiber Reinforcement. *Fibers and Polymers*, 23(7), 2017-2029.
- ❖ Kocaman, M., & Çuvalcı, H. The evolution of tribological properties of graphite and glass fiber reinforced novolac matrix hybrid composites. *Polymer Composites*.
- ❖ Çelebi, M., Güler, O., Çanakçı, A., & Çuvalcı, H. (2021). The effect of nanoparticle content on the microstructure and mechanical properties of ZA27-Al₂O₃-Gr hybrid nanocomposites produced by powder metallurgy. *Journal of Composite Materials*, 55(24), 3395-3408.



Prof. Dr. Sultan Öztürk

Doctorate: Karadeniz Technical University, Engineering Faculty, Mechanical Engineering, Turkey, 2001

Postgraduate: Akdeniz University, Agricultural Machinery, Türkiye, 1995

Undergraduate: Gazi University, Faculty of Technical Education, Production Engineering, Turkey, 1985

Research Areas

Metallurgical and Materials Engineering, Material science and engineering, Testing and Control of Materials, Electrical and Magnetic Properties, Material Characterization, Engineering and Technology

❖ Publications

- ❖ Öztürk, S., Alptekin, F., Önal, S., Sünbül, S. E., Şahin, Ö., & İçin, K. (2022). Effect of titanium addition on the corrosion behavior of CoCuFeNiMn high entropy alloy. *Journal of Alloys and Compounds*, 903, 163867.
- ❖ İçin, K., Öztürk, S., Çakıl, D. D., Sünbül, S. E., Ergin, İ., & Özçelik, B. (2022). Investigation of nano-crystalline strontium hexaferite magnet powder from mill scale waste by the mechanochemical synthesis: Effect of the annealing temperature. *Materials Chemistry and Physics*, 290, 126513.
- ❖ Sünbül, S. E., İçin, K., Eroğlu, M., & Öztürk, S. (2022). Effect of the Mn Amount on the Structural, Thermal, and Magnetic Properties of Rapidly Solidified (87-x) Cu-13Al-xMn (wt.%) Alloy Ribbons. *Journal of Materials Engineering and Performance*, 31(4), 2761-2769.



Academic Staff



Prof. Dr. Ahmet Sari

Doctorate: Karadeniz Technical University, Chemistry, Türkiye, 2000

Postgraduate: Karadeniz Technical University, Chemistry, Türkiye, 1996

Undergraduate: Karadeniz Technical University, Chemistry, Türkiye, 1993

Research Areas

Chemistry, Physicochemistry, Functional Polymers, Chemical Kinetics, Composites, Nanocomposites, Polymeric Materials, Thermodynamics, Natural Sciences

Publications

- ❖ Gencel, O., Sari, A., Kaplan, G., Ustaoglu, A., Hekimoğlu, G., Bayraktar, O. Y., & Ozbakkaloglu, T. (2022). Properties of eco-friendly foam concrete containing PCM impregnated rice husk ash for thermal management of buildings. *Journal of Building Engineering*, 58, 104961.
- ❖ Tyagi, V. V., Chopra, K., Sharma, R. K., Pandey, A. K., Tyagi, S. K., Ahmad, M. S., ... & Kothari, R. (2022). A comprehensive review on phase change materials for heat storage applications: Development, characterization, thermal and chemical stability. *Solar Energy Materials and Solar Cells*, 234, 111392.
- ❖ Gencel, O., Yaras, A., Hekimoğlu, G., Ustaoglu, A., Erdogmus, E., Sutcu, M., & Sari, A. (2022). Cement based-thermal energy storage mortar including blast furnace slag/capric acid shape-stabilized phase change material: Physical, mechanical, thermal properties and solar thermoregulation performance. *Energy and Buildings*, 258, 111849.



Prof. Dr. Aykut Çanakçı

Doctorate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 2006

Postgraduate: Karadeniz Technical University, Mechanical Engineering, Türkiye 1998

Undergraduate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 1994

Research Areas

Metallurgical and Materials Engineering, Ceramic Materials, Mechanical Properties, Corrosion, Non-destructive Testing, Composites, Biomaterials, Material Characterization, Metallic Materials, Nanomaterials, Production Metallurgy

Publications

- ❖ Çelebi, M., Çanakçı, A., Güler, O., Özkaya, S., Karabacak, A. H., & Arpacı, K. A. (2022). Investigation of Microstructure, Hardness and Wear Properties of Hybrid Nanocomposites with Al2024 Matrix and Low Contents of B4C and h-BN Nanoparticles Produced by Mechanical Milling Assisted Hot Pressing. *JOM*, 1-13.
- ❖ Canpolat, Ö., Çanakçı, A., & Erdemir, F. (2022). Evaluation of microstructure, mechanical, and corrosion properties of SS316L/Al2O3 composites produced by hot pressing. *Materials Chemistry and Physics*, 280, 125826.
- ❖ Karabacak, A. H., Çanakçı, A., Erdemir, F., Özkaya, S., & Çelebi, M. (2022). Corrosion and Mechanical Properties of Novel AA2024 Matrix Hybrid Nanocomposites Reinforced with B4C and SiC Particles. *Silicon*, 1-13.



Prof. Dr. Bülent Öztürk

Post Doctorate: Virginia Commonwealth University, Mechanical Engineering, ABD, 2011

Doctorate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 2004

Postgraduate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 1998

Undergraduate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 1994

Research Areas

Tribology, Plastic Forming Methods Metallurgical and Materials Engineering, Materials Science and Engineering, Testing and Control of Materials, Mechanical Properties, Composites, Powder Metallurgy

Publications

- ❖ Topcu, A., Öztürk, B., & Cora, Ö. N. (2022). Performance evaluation of machined and powder metallurgically fabricated Crofer® 22 APU interconnects for SOFC applications. *International Journal of Hydrogen Energy*, 47(5), 3437-3448.
- ❖ Öztürk, B., Topcu, A., & Cora, Ö. N. (2021). Influence of processing parameters on the porosity, thermal expansion, and oxidation behavior of consolidated Fe22Cr stainless steel powder. *Powder Technology*, 382, 199-207.
- ❖ Özen, İ., Gedikli, H., & Öztürk, B. (2021). Improvement of solid particle erosion resistance of helicopter rotor blade with hybrid composite shield. *Engineering Failure Analysis*, 121, 105175.



Academic Staff



Assoc. Prof. Dr. Temel Varol

Doctorate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 2016

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2012

Undergraduate: Atatürk University Mechanical Engineering, Türkiye, 2002

Research Areas

Mechanical Engineering, Construction and Manufacturing, Tribology Metallurgical and Materials Engineering, Composites, Coating Technologies, Production Metallurgy, Powder Metallurgy

Publications

- ❖ Aksa, H. C., Hacisalihoğlu, İ., Yıldız, F., Varol, T., Güler, O., Kaya, G., & Akçay, S. B. (2022). Effects of fabrication parameters and post-processing treatments on the mechanical and tribological behavior of surface-enhanced copper-based materials by selective laser melting. *Journal of Materials Processing Technology*, 304, 117564.
- ❖ Varol, T., Güler, O., Akçay, S. B., & Çuvalcı, O. (2022). Enhancement of electrical and thermal conductivity of low-cost novel Cu-Ag alloys prepared by hot-pressing and electroless plating from recycled electrolytic copper powders. *Materials Chemistry and Physics*, 281, 125892.
- ❖ Varol, T., Güler, O., Akçay, S. B., & Çolak, H. (2022). The evolution of microstructure and properties of Cu-Cr alloys synthesized via flake powder metallurgy assisted by mechanical alloying and hot pressing. *Materials Today Communications*, 33,



Assoc. Prof. Dr. Mustafa Aslan

Doctorate: Danmarks Tekniske Universitet (Technical University of Denmark), Material Science, Denmark, 2012

Postgraduate: Karadeniz Technical University, Forest Industry Engineering, Türkiye, 2007

Undergraduate: Karadeniz Technical University, Forest Industry Engineering, Türkiye, 2003

Research Areas

Metallurgical and Materials Engineering, Material Science and Engineering, Composites, Polymeric Materials, Materials Characterization, Cellulosic Materials, Engineering and Technology

Publications

- ❖ Holy, S., Temiz, A., Köse Demirel, G., Aslan, M., & Mohamad Amini, M. H. (2022). Physical properties, thermal and fungal resistance of Scots pine wood treated with nano-clay and several metal-oxides nanoparticles. *Wood Material Science & Engineering*, 17(3), 176-185.
- ❖ Kahya, V., Okur, F. Y., Karaca, S., Altunışık, A. C., & Aslan, M. (2021, December). Multiple damage detection in laminated composite beams using automated model update. In *Structures (Vol. 34, pp. 1665-1683)*. Elsevier.
- ❖ Bilgin, S., Güler, O., Alver, Ü., Erdemir, F., Aslan, M., & Çanakçı, A. (2021). Effect of TiN, TiAlCN, AlCrN, and AlTiN ceramic coatings on corrosion behavior of tungsten carbide tool. *Journal of the Australian Ceramic Society*, 57(1), 263-273.



Assoc. Prof. Dr. Fatih Erdemir

Doctorate: Karadeniz Technical University, Mechanical Engineering, Türkiye, 2016

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2011

Undergraduate: Eskisehir Osmangazi University, Metallurgical and Materials Engineering, Türkiye, 2006

Research Areas

Metallurgical and Materials Engineering, Engineering and Technology

Publications

- ❖ Canpolat, Ö., Çanakçı, A., & Erdemir, F. (2022). Evaluation of microstructure, mechanical, and corrosion properties of SS316L/Al₂O₃ composites produced by hot pressing. *Materials Chemistry and Physics*, 280, 125826.
- ❖ Karabacak, A. H., Çanakçı, A., Erdemir, F., Özkaya, S., & Çelebi, M. (2022). Corrosion and Mechanical Properties of Novel AA2024 Matrix Hybrid Nanocomposites Reinforced with B₄C and SiC Particles. *Silicon*, 1-13.
- ❖ Erdemir, F., Güler, O., & Çanakçı, A. (2021). Electroless nickel-phosphorus coated expanded graphite paper: binder-free, ultra-thin, and low-cost electrodes for high-performance supercapacitors. *Journal of Energy Storage*, 44, 103364.



Academic staff



Assist. Prof. Raşit Sezer

Doctorate: Istanbul Technical University, Metallurgical and Materials Engineering, Türkiye, 2018

Degree: Yıldız Technical University, Metallurgical and Materials Engineering / Production, Türkiye, 2013

Licence: Yıldız Technical University, Metallurgical and Materials Engineering, Türkiye, 2008

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Manufacturing Metallurgy, Engineering and Technology

Publications

- ❖ Sünbül, SE, İçin, K., Şeren, FZ, Şahin, Ö., Çakıl, DD, Sezer, R., & Öztürk, S. (2021). Determination of structural, tribological, isothermal oxidation and corrosion properties of Al-Co-Cr-Fe-Ni-Ti-Cu high-entropy alloy. *Vacuum*, 187, 110072.
- ❖ Sezer, R., Bilen, A., Quick, G., Ertürk, S., & Arslan, C. (2020). Effects of furnace slope and rotational speed on the carbothermic reduction of celestite in a laboratory-scale rotary kiln furnace. *Mining, Metallurgy & Exploration*, 37(4), 1273-1278.
- ❖ Sezer, R., Quick, G., Bilen, A., Ertürk, S., Dışpınar, D., & Arslan, C. (2020). Metallurgical Production of Aluminum-Strontium Master Alloy for Modification of Silicon. *Metallography, Microstructure, and Analysis*, 9(6), 833-840.



Res. Assist. (PhD) Kürşat İçin

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2022

Degree: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2016

Licence: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2013

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Materials Testing and Control, Electrical and Magnetic Properties, Intermetallics, Material Characterization, Metallic Materials, Manufacturing Metallurgy, Non-Ferrous Metal Production, Engineering and Technology

Publications

- ❖ Öztürk, S., Alptekin, F., Önal, S., Sünbül, SE, Şahin, Ö., & For, K. (2022). Effect of titanium addition on the corrosion behavior of CoCuFeNiMn high entropy alloy. *Journal of Alloys and Compounds*, 903, 163867.
- ❖ For, K., Öztürk, S., Çakıl, DD, Sünbül, SE, Ergin, İ., & Özçelik, B. (2022). Investigation of nano-crystalline strontium hexaferrite magnet powder from mill scale waste by the mechanochemical synthesis: Effect of the annealing temperature. *Materials Chemistry and Physics*, 290, 126513.
- ❖ Sünbül, SE, For, K., Eroğlu, M., & Öztürk, S. (2022). Effect of the Mn Amount on the Structural, Thermal, and Magnetic Properties of Rapidly Solidified (87-x) Cu-13Al-xMn (wt.%) Alloy



Res. Assist. (PhD) Gokhan Hekimoğlu

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, Ongoing

Degree: The University of Manchester, School Of Materials, UK, 2016

Licence: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2012

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Nanomaterials, Engineering and Technology

Publications

- ❖ Gencel, O., Sari, A., Kaplan, G., Ustaoglu, A., Hekimoğlu, G., Bayraktar, OY, & Ozbakkaloglu, T. (2022). Properties of eco-friendly foam concrete containing PCM impregnated rice husk ash for thermal management of buildings. *Journal of Building Engineering*, 58, 104961.
- ❖ Gencel, O., Yaras, A., Hekimoğlu, G., Ustaoglu, A., Erdogmus, E., Sutcu, M., & Sari, A. (2022). Cement based-thermal energy storage mortar including blast furnace slag/capric acid shape-stabilized phase change material: Physical, mechanical, thermal properties and solar thermoregulation performance. *Energy and Buildings*, 258, 111849.
- ❖ Gencel, O., Ustaoglu, A., Benli, A., Hekimoğlu, G., Sari, A., Erdogmus, E., ... & Bayraktar, OY (2022). Investigation of physico-mechanical, thermal properties and solar thermoregulation performance of shape-stable attapulgite



Academic staff



Res. Assist. (PhD) Zafer Golbasi

Doctorate:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, Ongoing

Degree:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2014

Licence:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2011

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Metallic Materials, Engineering and Technology



Res. Assist. Muslim Celebi

Doctorate:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, Ongoing

Degree:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2016

Licence:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2012

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Mechanical Properties, Composites, Physical Metallurgy, Materials Characterization, Nanomaterials, Engineering and Technology

Publications

- ❖ Çelebi, M., Çanakçı, A., Güler, O., Özkaya, S., Karabacak, AH, & Arpacı, KA (2022). Investigation of Microstructure, Hardness and Wear Properties of Hybrid Nanocomposites with Al₂O₃ Matrix and Low Contents of B₄C and h-BN Nanoparticles Produced by Mechanical Milling Assisted Hot Pressing. JOM, 1-13.
- ❖ Karabacak, AH, Çanakçı, A., Erdemir, F., Özkaya, S., & Çelebi, M. (2022). Corrosion and Mechanical Properties of Novel AA2024 Matrix Hybrid Nanocomposites Reinforced with B₄C and SiC Particles. Silicon, 1-13.
- ❖ Çelebi, M., Güler, O., Çanakçı, A., & Çuvalcı, H. (2021). The effect of nanoparticle content on the microstructure and mechanical properties of ZA27-Al₂O₃-Gr hybrid nanocomposites produced by powder metallurgy. Journal of Composite Materials, 55(24), 3395-3408.



Res. Assist. (PhD) Onur Guler

Doctorate:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, Ongoing

Degree:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2015

Licence:Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2012

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Composites, Engineering and Technology

Publications

- ❖ Aksa, HC, Hacısalihoğlu, İ., Yıldız, F., Varol, T., Güler, O., Kaya, G., & Akçay, SB (2022). Effects of fabrication parameters and post-processing treatments on the mechanical and tribological behavior of surface-enhanced copper based materials by selective laser melting. Journal of Materials Processing Technology, 304, 117564.
- ❖ Kocaman, M., Çuvalcı, H., & Güler, O. (2022). Novel Flame-retarded Novolac Matrix Hybrid Composites with Graphite Particles and Glass Fiber Reinforcement. Fibers and Polymers, 23(7), 2017-2029.
- ❖ Varol, T., Güler, O., Akçay, SB, & Çuvalcı, O. (2022). Enhancement of electrical and thermal conductivity of low-cost novel Cu-Ag alloys prepared by hot-pressing and electroless plating from recycled electrolytic copper powders. Materials Chemistry and Physics, 281, 125892.



Academic Staff



Res. Assist. Abdullah Hasan Karabacak

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2018

Undergraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2014

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Composites, Nanomaterials, Engineering and Technology

Publications

- ❖ Çelebi, M., Çanakçı, A., Güler, O., Özkaya, S., Karabacak, A. H., & Arpacı, K. A. (2022). Investigation of Microstructure, Hardness and Wear Properties of Hybrid Nanocomposites with Al₂O₃ Matrix and Low Contents of B₄C and h-BN Nanoparticles Produced by Mechanical Milling Assisted Hot Pressing. *JOM*, 1-13.
- ❖ Karabacak, A. H., Çanakçı, A., Erdemir, F., Özkaya, S., & Çelebi, M. (2022). Corrosion and Mechanical Properties of Novel AA2024 Matrix Hybrid Nanocomposites Reinforced with B₄C and SiC Particles. *Silicon*, 1-13.
- ❖ Çevik, Z. A., Karabacak, A. H., Kök, M., Çanakçı, A., Kumar, S. S., & Varol, T. (2021). The effect of machining processes on the physical and surface characteristics of AA2024-B₄C-SiC hybrid nanocomposites fabricated by hot pressing method. *Journal of Composite Materials*, 55(19), 2657-2671.



Res. Assist. Sümran Bilgin

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2022

Undergraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2017

Research Areas

Metallurgical and Materials Engineering, Materials Science and Engineering, Production Metallurgy, Nanomaterials, Energy Storage

Publications

- ❖ Erdemir, F., Tuzcu, E., Bilgin, S., Alver, Ü., & Çanakçı, A. (2021). Influence of fluorine doping of zinc oxide on its electrochemical performance in supercapacitors. *Materials Chemistry and Physics*, 259, 124033.
- ❖ Alver, Ü., Tascioğlu, M.E., Güler, O. et al. Optical and Dielectric Properties of PMMA/ α -Fe₂O₃-ZnO Nanocomposite Films. Optical and dielectric properties of PMMA/ α -Fe₂O₃-ZnO nanocomposite films. *Journal of Inorganic and Organometallic Polymers and Materials*, 29(5), 1514-1522.
- ❖ Bilgin, S., Güler, O., Alver, Ü., Erdemir, F., Aslan, M., & Çanakçı, A. (2021). Effect of TiN, TiAlCN, AlCrN, and AlTiN ceramic coatings on corrosion behavior of tungsten carbide tool. *Journal of the Australian Ceramic Society*, 57(1), 263-273.



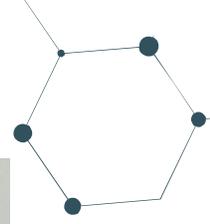
Res. Assist. Sedat Alperen Tunç

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Undergraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2020

Research Areas

Metallurgical and Materials Engineering, Production Metallurgy, Engineering and Technology



Res. Assist. Mücahit Kocaman

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2022

Undergraduate: Bursa Technical University, Mechatronic Engineering, Türkiye, 2017

Research Areas

Metallurgical and Materials Engineering, Material Science and Engineering, Composites, Polymeric Materials

Publications

- ❖ Kocaman, M., Çuvalcı, H., & Güler, O. (2022). Novel Flame-retarded Novolac Matrix Hybrid Composites with Graphite Particles and Glass Fiber Reinforcement. *Fibers and Polymers*, 23(7), 2017-2029.
- ❖ Kocaman, M., & Çuvalcı, H. The evolution of tribological properties of graphite and glass fiber reinforced novolac matrix hybrid composites. *Polymer Composites*.



Res. Assist. Serhatcan Berk Akçay

Doctorate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2022

Undergraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, 2018

Research Areas

Material science and engineering, Testing and Control of Materials, Composites, Biomaterials, Plating, Material Characterization, Metallic Materials, Non-Ferrous Alloy Production, Electrolytic Coating, Electrometallurgy, Recycling Processes, Non-Metallic Materials Production, Powder Metallurgy

Publications

- ❖ Varol, T., Güler, O., Akçay, S. B., & Çolak, H. (2022). The evolution of microstructure and properties of Cu-Cr alloys synthesized via flake powder metallurgy assisted by mechanical alloying and hot pressing. *Materials Today Communications*, 33, 104452.
- ❖ Aksa, H. C., Hacısalihoğlu, İ., Yıldız, F., Varol, T., Güler, O., Kaya, G., & Akçay, S. B. (2022). Effects of fabrication parameters and post-processing treatments on the mechanical and tribological behavior of surface-enhanced copper based materials by selective laser melting. *Journal of Materials Processing Technology*, 304, 117564.
- ❖ Varol, T., Güler, O., Akçay, S. B., & Çuvalcı, O. (2022). Enhancement of electrical and thermal conductivity of low-cost novel Cu-Ag alloys prepared by hot-pressing and



Res. Assist. Hamit Ali Reis

Postgraduate: Karadeniz Technical University, Metallurgical and Materials Engineering, Türkiye, *Continues*

Undergraduate: Istanbul Technical University, Metallurgical and Materials Engineering, Türkiye, 2021

Research Areas

Metallurgical and Materials Engineering, Material Science and Engineering, Energy Storage Materials, Supercapacitors