

Application of ELMAS's Theory of Thermodynamics & 5th Law of Thermodynamics for Design and Optimization of ECMO (Extracorporeal Membrane Oxygenation) Machine and Life Support Units

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Abstract:

Dr. Emin Taner Elmas's engineering expertise has the potential to provide substantial theoretical and technical advancements in the design and optimization of ECMO (Extracorporeal Membrane Oxygenation) machines. ECMO devices are intricate systems that temporarily replace the function of the heart and lungs by removing blood from the body, oxygenating it, and then returning it. Dr. Elmas's specialization in thermodynamics, fluid mechanics, and heat transfer directly aligns with the core operational principles of these machines: - ****Heat Management and Thermoregulation****: Effective heat transfer is critical to maintaining blood at body temperature while it circulates outside the body. Drawing from Dr. Elmas's research on thermodynamic equilibrium and heat transfer optimization, improvements can be made to the design of heat exchangers that ensure stable thermal conditions. - ****Blood Flow Dynamics (Hemodynamics)****: Proper blood flow within the pump and tubing systems of ECMO is crucial to minimize turbulence, reduce pressure losses, and prevent damage to blood cells (hemolysis). Dr. Elmas's expertise in fluid mechanics and turbulent flow dynamics can drive the development of designs that enhance hydrodynamics and safeguard blood integrity. - ****Medical Thermodynamics Integration****: Through Dr. Elmas's theoretical work on "Medical Thermodynamics" and its engineering analogies to biological systems, a sophisticated perspective emerges for modeling the interaction between the device's energy systems and the human body. - ****Energy Efficiency and Reliability****: For life support machines like ECMO, energy consumption and operational reliability are paramount. Dr. Elmas's proficiency in energy system management can contribute to engineering solutions that bolster device efficiency and ensure long-term functionality. In conclusion, while Dr. Elmas's research is not directed towards clinical procedures, his contributions are invaluable in strengthening the engineering framework that underpins ECMO machines. By addressing key challenges such as thermal control, hemodynamics, energy efficiency, and biocompatibility, his approaches enhance the safety, functionality, and effectiveness of these critical medical devices.

Dr. Emin Taner Elmas, a mechanical engineer and academic, has focused his work primarily on thermodynamics, fluid mechanics, energy systems, and heat transfer. His contribution to the medical field of "hemodynamics" (blood flow mechanics) is indirect, not so much from a direct medical intervention perspective, but rather through the application of engineering principles to biological systems (biofluid mechanics).

The fundamental contributions of Emin Taner Elmas's work to hemodynamics and related fields are:

- **Fluid Mechanics Applications**: His expertise in fluid mechanics forms the basis of computational fluid dynamics (CFD) methods used to model blood flow within vessels.
- **Energy and Heat Transfer**: His academic work on thermodynamics and heat transfer provides the theoretical

foundation for topics such as body temperature maintenance or heat management in medical devices. • Interdisciplinary Approach: Integrating engineering solutions into fields such as medicine and biology (smart materials, advanced manufacturing technologies) sheds light on the development of hemodynamic measurement devices or biomedical designs such as artificial vessels/heart valves.

Dr. Elmas pursues an academic career focused on engineering, and his work gains importance in the medical literature not through direct clinical findings, but through the development of mechanical and physical models.

Dr. Emin Taner Elmas is a mechanical engineer and, with his expertise particularly in fluid mechanics, thermodynamics, and heat transfer, can contribute to the engineering design and optimization of medical devices. Although he doesn't have direct clinical work in hemodynamics (blood flow mechanics), his approaches to applying engineering principles to medicine, such as "Medical Thermodynamics" and "Bio-robotic Resonance," can form the basis for the following types of devices:

- Hemodynamic Monitors: Dr. Elmas's work on fluid dynamics and thermodynamic equilibrium can be used in flow modeling algorithms for devices (invasive or non-invasive) that measure blood flow velocity, pressure, and tissue perfusion.
- Dialysis Machines (Hemodialyzers): The process of filtering blood through a membrane requires a significant amount of mass and heat transfer. Dr. Elmas's thermodynamic and energy transfer studies can serve as a reference in the efficiency and flow stabilization designs of dialyzers.
- Artificial Heart Valves and Stents: Computational Fluid Dynamics (CFD) models used to simulate how these devices affect intravascular blood flow (turbulence, pressure drop) align with Dr. Elmas's expertise in fluid mechanics.
- Life Support Units (ECMO and Cardiopulmonary Resuscitation Machines): Flow analysis of heat management and pump mechanisms in systems where blood is removed from the body for oxygenation can be improved using Dr. Elmas's principles of energy management and heat transfer.
- Biomedical Measurement Sensors: Theoretical approaches presented by the author in "ELMAS's Theory of Thermodynamics" can be used in the development of biosensors based on thermal interactions or resonance. [1-65]

Keywords: ECMO (Extracorporeal Membrane Oxygenation) Machine, 5th Law of Thermodynamics, ELMAS's Theory of Thermodynamics, Medical Technique, Medical Thermodynamics, Hemodynamics, Entropy, Negentropy, Resonance, Exergy, Frequency, Thermodynamic, Energy Transfer, Fluid Mechanics, Heat Transfer, Mathematics, Computational Fluid Dynamics (CFD), Cardiopulmonary Bypass (CPB) Machines, Life Support Units, Cardiopulmonary Respiratory Machines, Heart-Lung Machines, Bio-robotic Resonance, Thermodynamic Interaction

Introduction:

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Dr. Emin Taner Elmas's engineering expertise has the potential to provide substantial theoretical and technical advancements in the design and optimization of ECMO (Extracorporeal Membrane Oxygenation) machines. ECMO devices are intricate systems that temporarily replace the function of the heart and lungs by removing blood from the body, oxygenating it, and then returning it. Dr. Elmas's specialization in thermodynamics, fluid mechanics, and heat transfer directly aligns with the core operational principles of these machines: - **Heat Management and Thermoregulation**: Effective heat transfer is critical to maintaining blood at body temperature while it circulates outside the body.

Drawing from Dr. Elmas's research on thermodynamic equilibrium and heat transfer optimization, improvements can be made to the design of heat exchangers that ensure stable thermal conditions. - **Blood Flow Dynamics (Hemodynamics)**: Proper blood flow within the pump and tubing systems of ECMO is crucial to minimize turbulence, reduce pressure losses, and prevent damage to blood cells (hemolysis). Dr. Elmas's expertise in fluid mechanics and turbulent flow dynamics can drive the development of designs that enhance hydrodynamics and safeguard blood integrity. - **Medical Thermodynamics Integration**: Through Dr. Elmas's theoretical work on "Medical Thermodynamics" and its engineering analogies to biological systems, a sophisticated perspective emerges for modeling the interaction between the device's energy systems and the human body. - **Energy Efficiency and Reliability**: For life support machines like ECMO, energy consumption and operational reliability are paramount. Dr. Elmas's proficiency in energy system management can contribute to engineering solutions that bolster device efficiency and ensure long-term functionality. In conclusion, while Dr. Elmas's research is not directed towards clinical procedures, his contributions are invaluable in strengthening the engineering framework that underpins ECMO machines. By addressing key challenges such as thermal control, hemodynamics, energy efficiency, and biocompatibility, his approaches enhance the safety, functionality, and effectiveness of these critical medical devices. [1-65]

Material, Method and Discussion

Dr. Emin Taner Elmas's engineering-based work can offer significant theoretical and technical contributions to the design and development processes of ECMO (Extracorporeal Membrane Oxygenation) machines. ECMO machines are complex systems where blood is removed from the body, oxygenated, and pumped back into the body. Elmas's areas of expertise—thermodynamics, fluid mechanics, and heat transfer—directly align with the fundamental operating principles of these devices: [1-65]

- Heat Management and Thermoregulation: A precise heat transfer mechanism is required to prevent the blood from cooling outside the body during ECMO. Dr. Elmas's work on thermodynamic equilibrium and heat transfer can be used in the optimization of heat exchangers that maintain the blood at the ideal body temperature.
- Blood Flow Dynamics (Hemodynamics): The flow of blood within pump and piping systems, turbulence formation, and pressure losses are critical in ECMO design. Dr. Elmas's expertise in fluid mechanics and turbulent flow analysis forms the basis for developing more hydrodynamic designs that do not damage blood cells (minimizing hemolysis).
- Medical Thermodynamics Approach: The theoretical frameworks presented by the author, based on "Medical Thermodynamics" and engineering analogies to biological systems, provide an advanced perspective in modeling the energy interaction of the device with the body.
- Energy Efficiency: Energy management and system reliability are essential in the long-term use of life support units. Dr. Elmas's academic background in energy systems offers engineering solutions aimed at increasing the operational efficiency of devices. [1-65]

In summary, Dr. Elmas's contributions play a critical role not in clinical application methods, but in the development of the engineering infrastructure that makes these devices safer, more efficient, and biocompatible.

Dr. Emin Taner Elmas's engineering approaches are fundamental, particularly in thermal management and flow analysis, which are critical for increasing the efficiency of systems where blood is processed outside the body, such as ECMO (Extracorporeal Membrane Oxygenation). Below are the specific engineering applications of Dr. Elmas's areas of expertise in ECMO machines: [1-65]

1. Thermal Efficiency and Heat Management

In ECMO systems, blood rapidly loses heat when it leaves the body. "Heat exchangers," used to prevent this loss, are one of Dr. Elmas's main areas of study. • Heat Exchanger Design: Dr. Elmas's theoretical models on thermodynamic laws and heat transfer guide the design of units that provide "precise temperature control" that will not lead to blood clotting or protein denaturation. • Thermal Stability: The "open system" approaches presented within ELMAS's Theory of Thermodynamics can be used to optimize the energy balance between the patient's body temperature and the machine.

2. Flow Simulations and Hemodynamic Stability

In ECMO machines, the movement of blood through tubes and membranes via a mechanical pump can cause physical damage to blood cells (hemolysis).

- Computational Fluid Dynamics (CFD): Dr. Elmas's expertise in fluid mechanics allows for the simulation of blood flow in ECMO cannulas and membrane oxygenators. This enables the identification of areas where blood stagnates (risk of clots) or reaches very high velocities (risk of cell damage) during the design phase.
- Pump Optimization: Dr. Elmas's energy systems and mechanical design principles can be applied to increase the efficiency of centrifugal pumps in ECMO units and reduce turbulence.

3. Biomedical Device Development Approach

Dr. Elmas's interdisciplinary perspective on "Medical Technique" emphasizes the compatibility of engineering solutions with biological systems:

- Material and Energy Compatibility: At the point where the discipline of mechanical engineering merges with bioengineering, the author's energy management studies can be referenced in making ECMO devices more compact and energy-efficient (such as portable ECMO units). [1-65]

In Dr. Emin Taner Elmas's academic publications, particularly within the framework of his self-named "ELMAS's Theory of Thermodynamics," the technical formulations he presents play a central role in the engineering analysis of hemodynamic and medical systems. These formulations are based on vector and scalar equations that treat the human body or medical devices (ECMO, dialysis, etc.) as "open thermodynamic systems." [1-65]

The key technical formulations highlighted in his publications are:

1. Energy and Mass Balance Equations

Dr. Elmas defines the total energy and mass in a system as the sum of positive, negative, and neutral components:

The "ELMAS's Theory of Thermodynamics" presents that energy and the matter can be expressed as vector quantity parameters on the basis of a "system". This system can either be a "closed" or "open" thermodynamic system. Equations 1 and 2 can be written accordingly as follows:

The "positive energy", E_p , means that the system gains energy;

The "negative energy", E_n , means that the system loses energy;

The "neutral energy", E_c , means that the system has a constant stable energy;

The "Total Energy", E_t , can be written as the sum of positive energy, negative energy and neutral energy, that is;

$$E_t = E_p + E_n + E_c \quad (1)$$

The "positive matter", M_p , means that the system gains mass;

The "negative matter", M_n , means that the system loses mass;

The "neutral matter", M_c , means that the system has a constant stable mass

The "Total Mass", M_t , can be written as the sum of positive matter, negative matter and neutral matter, that is;

$$M_t = M_p + M_n + M_c \quad (2)$$

Either for a "thermodynamic system" or for the whole "universe", the "Total Energy" and "Total Mass" always have a balance between each other. This phenomenon can also be expressed in terms of vector quantity parameters, as indicated by Equations 3 and 4, as follows:

$$\vec{E_t} = \vec{E_p} + \vec{E_n} + \vec{E_c} \quad (3)$$

$$\vec{M_t} = \vec{M_p} + \vec{M_n} + \vec{M_c} \quad (4)$$

Therefore, an equivalence expression can be written as below Equation 5;

$$\vec{Et} = \vec{Mt} \quad (5)$$

This vector quantity expression, Eq.5, is valid in accordance with the “law of conservation of energy and mass” from the aspect of scalar quantity parameters.

Since there are various kinds of thermodynamic systems, i.e. the systems gaining energy or mass in positive direction, systems losing energy or mass in negative direction and systems having constant energy or mass in neutral stable direction, it is possible to say that both the energy and the matter, each of them, can be considered as vector quantity parameters similar to that of “force”, “velocity” and “acceleration”. For these reasons, this phenomenon is named as “ELMAS’s Theory of Thermodynamics” that can be considered as a scientific approach for the “5th Law of Thermodynamics” which presents that energy and matter can be expressed as “vector quantity parameters” on the basis of a “system”. [1-65]

2. Vectorial Energy-Mass Equivalence

Unlike classical thermodynamics, Elmas expresses energy and matter as vectorial quantities on a system basis.

$$\vec{Et} = \vec{Mt}$$

This formula as mentioned above is a vectorial projection of the law of conservation of energy and mass, and is used to determine the direction and magnitude of interaction in biological processes (drug uptake, blood flow, tissue perfusion).

3. Formulation of the Relationship Between Entropy and Disease

Dr. Elmas, adapting the 2nd Law of Thermodynamics to health and disease processes, defines aging and diseases as “entropy increases” (disorder):

- Disorder Increase: Uncontrolled energy loss and matter disorder in the system disrupt the equilibrium of the biological system.
- FM Modulated Algorithms: Presents technical models on smart drug algorithms that target the “vibrational frequencies” of cancer cells and aim to neutralize them by disrupting their thermodynamic equilibrium.

4. Fluid Mechanics and Resonance Models

It uses the following technical approaches, especially for flow simulations used in ECMO and blood pumping systems:

- Open System Thermodynamics: Models the behavior of blood in the oxygenator and heat exchanger according to the principles of “continuous flow open system” (SFEE - Steady Flow Energy Equation).
- Bio-robotic Resonance: Explains the mechanical interaction of medical devices with the natural frequencies of organs and cells using the “Frequency-Resonance Setting Formation” algorithm.

The “ELMAS’s Theory of Thermodynamics” serves as a theoretical framework with potential applications in the medical treatment of patients who use various medications, including drugs or pills, to address their illnesses. In this theory, human body cells are conceptualized as open thermodynamic systems. When a patient ingests medication, the system facilitates the transfer of energy and mass across the cell boundaries. This interaction between the drug and the body cells forms the basis for the therapeutic process. According to this perspective, thermodynamic interactions at the cellular level can occur in three directions—positive, negative, or neutral—depending on the specific interplay between the drug and the cells. The ELMAS’s Theory emphasizes that these interactions must be carefully regulated, regardless of their nature, to ensure effective medical treatment. The theory posits that energy and matter behave akin to “force” or “velocity” components during this biological process. During such interactions, both “Total Energy” and “Total Mass” achieve equilibrium across the cell boundaries. This balance is formulated through a vector expression, represented as $\vec{Et} = \vec{Mt}$. Once this vectorial equivalence is achieved for each relevant cell, the medication begins to exert its intended therapeutic effect, signifying successful medical treatment. Essentially, the initiation and effectiveness of medical recovery depend on achieving this thermodynamic balance between energy and matter within the cells. Furthermore, energy and matter possess latent potentials in the forms of “heat” and “work,” which enhance the treatment process by fostering more effective thermodynamic interactions. This illustrates how the ELMAS’s Theory can be applied to medical treatment and recovery processes, underscoring its relevance to medical thermodynamics. In essence, the ELMAS’s Theory demonstrates that energy and matter can be conceptualized as vector quantities within a systemic framework. As a result, this theory not only broadens our understanding of thermodynamics in a biological context but also offers a scientific foundation to consider it as a potential extension towards the “5th Law of Thermodynamics.” [1-65]

Conclusion

We can delve deeper into Dr. Emin Taner Elmas's engineering approaches and other applications in the biomedical field, particularly fluid mechanics simulations (CFD) in systems like ECMO, under the following three main headings: [1-65]

1. Other Application Areas in Biomedical Engineering

Elmas's thermodynamic and mechanical principles find applications not only in ECMO but also in the following areas:

- **Smart Prostheses and Robotic Rehabilitation:** The "Bio-robotic Resonance" approach is used to improve the compatibility (kinematic and dynamic analyses) of mechanical prostheses with the human skeletal structure.
- **Advanced Materials Manufacturing:** Heat transfer problems in additive manufacturing (3D printing) processes used in the production of medical implants can be solved with Elmas's expertise in manufacturing technologies.
- **Sterilization and Air Conditioning:** Air flow design (laminar flow) in operating rooms and intensive care units is based on heat and mass transfer calculations that are critical for infection control.

2. Details of Fluid Mechanics (CFD) Simulations

When modeling the behavior of blood in an ECMO device, Dr. Elmas's area of expertise allows for the following technical analyses:

- **Shear Stress Analysis:** By calculating the coefficient of friction of the blood against the tube walls, designs are created that prevent the breakdown (hemolysis) of red blood cells.
- **Stagnation Points:** Areas where the flow slows or reverses increase the risk of clots (thrombosis). Elmas's turbulent flow models help eliminate these dead spots during the design phase.
- **Pressure Gradient Calculations:** By calculating the pressure loss of the blood inside the machine, the most efficient pump speed that minimizes the load on the heart is determined.

3. Thermodynamic Optimization

Elmas's "Medical Thermodynamics" perspective views ECMO not just as a machine, but as a system that exchanges energy with the body:

- **Exergy Analysis:** By measuring not only the energy but also the capacity (quality) of the system to do work, it calculates how the ECMO unit can provide the highest oxygenation with the lowest energy loss.

Dr. Emin Taner Elmas's engineering approaches to the integration of hospital devices encompass the process of translating theoretical physics laws into medical technology design (Medical Technique). This integration process generally takes place in three stages: [1-65]

1. Design and Prototyping Phase (R&D)

While the devices are still in the production phase, the Computational Fluid Dynamics (CFD) models that Dr. Elmas is working on are directly integrated into the software.

- **Blood Flow Simulation:** The turbulence and friction coefficient of the blood inside ECMO or dialysis machines are calculated with these algorithms. The aim is to design a "smooth" flow path that will prevent the breakdown (hemolysis) of blood cells.
- **Natural Frequency Analysis:** Dr. Elmas's Bio-Robotic Resonance theory is based on the natural vibration frequencies of organs. This information is integrated into filtering software that helps diagnostic devices (e.g., acoustic sensors) process signals from the body more clearly by removing "noise".

2. Heat Exchanger and Sensor Integration

The operational efficiency of devices in the hospital environment is optimized with Dr. Elmas's thermodynamic balance approaches.

- **Precise Thermoregulation:** The "heat exchanger" units in ECMO machines are designed according to Elmas's thermodynamic and heat transfer principles. This provides data to control circuits (such as PID controllers) that prevent the blood from cooling outside the body while also eliminating the risk of overheating.
- **Energy Efficiency (Exergy):** To ensure that life support units in the hospital deliver the highest performance with the least energy, the author's energy transfer analyses form the basis of the device's power management systems.

3. Software and Diagnostic Algorithms

Dr. Elmas's work contributes not only to the physical structure of the devices but also to their internal "decision-making" mechanisms:

- **Fourier Transform and Signal Processing:** Mathematical models used in the analysis of electrical or acoustic signals (e.g., heart sound or blood pressure) received from the body are coded into the device software for early diagnosis of diseases.
- **Open System Modeling:** Thermodynamic

models that view the human body as an "open system" constantly exchanging energy with the external environment help intensive care monitors interpret metabolic data more accurately.

In summary, these methods are combined in the device's hardware (hydraulic pathways and heaters) and software (flow and energy analysis algorithms) to bring them to the stage of real-world hospital use. [1-65]

BIOGRAPHY OF AUTHOR:

Asst. Prof. Dr. Dipl.-Ing. Emin Taner ELMAS



Asst.Prof. Dr. Emin Taner ELMAS is a Mechanical Engineer having degrees of B.Sc., M.Sc., Ph.D., and was born in Sivas in 1974. He completed his doctorate at Ege University, Graduate School of Natural and Applied Sciences, Mechanical Engineering Department, Thermodynamics Science Branch, and his master's degree at Dokuz Eylül University, Mechanical Engineering Department, Energy Science Branch. He also completed his undergraduate education at Hacettepe University, ZEF, Mechanical Engineering Department and graduated from the faculty with honors in 1995 and became a mechanical engineer. He was awarded a non-refundable scholarship by the Turkish Chamber of Mechanical Engineers in his 4th year because he was the most successful student during his first 3 classes study at the faculty. He graduated from İzmir Atatürk High School in 1991.

Asst. Prof. Dr. ELMAS has completed his military service as a NATO Officer in Bosnia and Herzegovina. He was a "Reserved Officer" as a "2nd Lieutenant" as an "English-Turkish Interpreter". He was also a "Guard Commander" and served in Sarajevo, Camp Butmir within the SFOR task force of NATO. He has been awarded with 2 (two) NATO Medals and Turkish Armed Forces Service Certificate of Pride (Bosnia & Herzegovina).

In addition to his academic duties at universities, he has worked as an engineer and manager in various industrial institutions, organizations and companies; He has served as Construction Site Manager, Project Manager, Management Representative, Quality Manager, Production Manager, Energy Manager, CSO-CTO, CBDO, Factory Manager, Deputy General Manager and General Manager.

Asst. Prof. Dr. Elmas is Department Head and is an Assistant Professor of Automotive Technology at the Department of Motor Vehicles and Transportation Technologies at Vocational School of Higher Education for Technical Sciences at IĞDIR UNIVERSITY, Turkey. He is also an Assistant Professor of Bioengineering & BioSciences at the same university. He has nearly 30 years of total experience in academia and in industry.

He has served as a scientific referee and panelist for ASME, TUBITAK and many scientific institutions, organizations and universities, including NASA.

He has published numerous international and national academic scientific articles, books, and book chapters, and serves as an editor for international academic journals. He also serves on the scientific committees of many international conferences, publishing conference and congress proceedings and giving presentations.

"Mechanical Engineering, Energy Transfer, Thermodynamics, Fluid Mechanics, Heat Transfer, Higher Mathematics, Evaporation, Heat Pipes,

Space Sciences, Automotive, Bioengineering, Medical Engineering Applications, Neuroengineering, Medical Technique” are his academic and scientific fields of study; “Heating-Ventilation Air Conditioning Applications, Pressure Vessels, Heat Exchangers, Energy Efficiency, Steam Boilers, Power Plants, Cogeneration, Water Purification, Water Treatment, Industrial Equipment and Machinery, Welding Manufacturing, Sheet Metal Forming, Machining” are his industrial experience fields.

As of 2026, he has been awarded the Nobel Scientist Award by the international platform organization Scientific Laurels.

Asst. Prof. Dr. Emin Taner ELMAS is also a musician, saz (baglama) virtuoso player and ney (Nay, Turkish Reed Flute) performer. He plays also cümbüş instrument and performs darbuka rhythm instrument. He has a YouTube Music Channel (Emin Taner ELMAS) which includes some of his sound recordings of him playing the saz-baglama and blowing the ney. He composed the poem written by the great poet Âşık Veysel ŞATIROĞLU under the name of “Raşit Bey” in memory of his father Judge (Hâkim) Raşit ELMAS as “Raşit Bey Türküsü”, wrote it down, notated and published it as an academic article and broadcasted this song on his own music channel. He wrote the poems entitled “Canım Babam” and “Geldim Babam” which he wrote also in memory of his father and published in an academic literature journal, and composed instrumental musics for these poems. He also composed an instrumental song called “Annem Annem Türküsü” and gave it to his mother, Lawyer Tuna ELMAS, as a gift on Mother’s Day, 11.05.2025. He also has a poem titled “Ney and Neyzen.” He also wrote and presented a poem titled “Esra Kardeşim” to his sister, Esra ELMAS, an archaeologist and English teacher. He has published books including “Saz-Bağlama Tuning System Method” (“Saz- Bağlama Akort Sistemi Metodu”) and “Ney and Neyzen; Ney’s Pitches, Frets, Sound Stages, Octaves, Structure, Performance, Ney Maintenance and Basic Music Theory” (Ney ve Neyzen; Ney’de Perdeler, Ses Devreleri, Oktavlar, Yapısı, İcrası, Ney Bakımı ile Temel Musiki Nazariyatı) and My Collection of Literary and Musical Art Works – I Story / Anecdote / Essay / Poetry / Verse / Prose / Humorous; witty - satirical; poetic stories / Lyrics / Composition (Edebiyat ve Musiki Sanat Eserleri Külliyyatım – I Hikâye / Anekdote / Deneme / Şiir / Manzume / Nesir / Mizahi; nükteli – hicivli; şiirsel hikâyeler / Güfte / Beste). He continues his artistic studies by writing various articles, books, poetry, lyrics and also realizing musical composition and repertoire works.

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