DEPARTMENT OF MECHATRONICS ENGINEERING

Mechatronics Engineering

- History

  Mechatronics Engineering Department is the most intense academic program in Karabuk University. Mechatronics Engineering Department was opened in 2010. Fields of study in this department are mechatronics, machine, computer software and hardware, control systems, electrical, electronics and robotics.

Mechatronics Engineering

- Mission

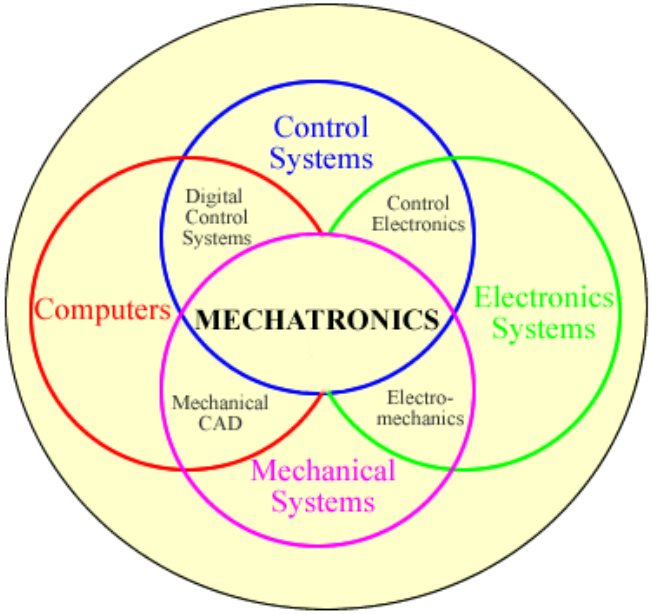
  Mechatronics Engineering is a discipline which is composed of Mechanical Engineering, Electric-Electronics Engineering, and Computer Engineering for solving the sensitive and intelligent product designing problems. Our mission is educating engineers who have application experience, and the ability, determining the problems of Mechatronics Engineering, formulation, modeling, analyzing, and the same time who embrace the modern universal ethos and believe the superiority of law.

- Vision

  Our vision is to educate with the same universal standards as international and national schools that has; strong possibilities, international quality standards, education application standards, strong relations with industry and to make a success of advanced researches, applications and scientific articles via guidance of Europe (Erasmus-Socrates), USA (ABET), and competence engineering principles (MUDEK) for science and technology.

About Mechatronics Engineering

- Mechatronics engineering is a new multidisciplinary engineering field which combines machine, electrics-electronics and computer science.
- Mechatronics engineering is applied for sensitive and smart product designing or request and problem solving



Administrative Staff

Prof. Dr. Raif BAYIR
Head of Department

Prof. Dr. Mustafa ANUTGAN
Vice Head of Department

Image

Name and Surname
Vice Head of Department

Mechatronics Engineering

Course Credits

- Elective courses:35
- Fundamental courses:12
- Engineering courses:46
- Field courses:96
- Total credits:164
- Credits of theoretical courses:107
- Credits of practical courses:57

Mechatronics Engineering

Double Major Programs

- Manufacturing Engineering
- Industrial Design Engineering
- Energy Systems Engineering
- Medical Engineering
- Mechanical Engineering

Mechatronics Engineering

- Graduate Programs
  Students are admited by a national exam.
  Students who pass all lessons (240 ects) graduate from the program.

- Master's Degree
  Students are admited by scienctific and language exams.
  Students who pass all lessons (120 ects) graduate from the program.

Mechatronics Engineering

- Department Members

- Number of Professor: 2
- Number of Associate Professor: 0
- Number of Assistant Professor: 3
- Number of Research Assistant: 3

Academic Staff

Prof. Dr. Raif BAYIR

E-mail: rbayir@karabuk.edu.tr
Phone: +90 370 418 71 00 / 1218
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Artificial Intelligence, Fuzzy Logic, Robotics, Electric Vehicles and Their Technology, Unmanned Air and Ground Vehicles, Fault Detection and Diagnosis in Electric Machines, Wireless Sensor Networks

Recent Academic Studies

1. Albayrak A., Duran, F., **Bayır R.**, Albayrak A., "Development of Intelligent Decision Support System Using Fuzzy Cognitive Maps for Mobile Beekeepers" Turkish J.of Electrical Engineering & Computer Sciences, (Baskıda) 2017.
2. Soylu E., Soylu T., **Bayır, R.** "Design and Implementation of SOC Prediction for a Li-Ion Battery Pack in an Electric Car with an Embedded System", Entropy 19 (4), 146, 2017.
3. Demir B E., **Bayır R.**, Duran F. "Real-time trajectory tracking of an unmanned aerial vehicle using a self-tuning fuzzy proportional integral derivative controller", International Journal of Micro Air Vehicles, 8 (4), 252-268, 2016.
4. Çeven, S., **Bayır, R.** "Implementation of Fuzzy Logic Based Speed Control Of Brushless Direct Current Motors Via Industrial PC", Int. Conference on Advanced Technology & Sciences (ICAT'16), Türkiye Konya, Eylül 1-3, 2016.

Academic Staff

Prof. Dr. Mustafa ANUTGAN

E-mail: mustafaanutgan@karabuk.edu.tr
Phone: +90 370 418 71 00 / 1026
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Technology of Semiconductor Device, Energy Harvesting with Piezoelectricity, Optical Diagnosis of Blood Sugar, Applied Mathematics

Recent Academic Studies

1. Anutgan, T., Anutgan, M., Atilgan, I., & Katircioglu, B. (2017). Electroformed silicon nitride based light emitting memory device. Applied Physics Letters, 111(5), 053502.
2. Amirov Sh., Anutgan M. (2017). Analytical solitary wave solutions for the nonlinear analogues of the Boussinesq and sixth-order modified Boussinesq equations. Journal of Applied Analysis and Computation, 7(4), 1613-1623.
3. Mustafa ANUTGAN, Tamila ANUTGAN, İsmail ATILGAN, Temporary Sub-band Transport Level in Nanocrystalline Silicon Nitride Light Emitting Memory Device, 27th International Conference on Amorphous and Nanocrystalline Semiconductors (ICANS27), 21-25 August 2017, Seoul National University, Seoul, Korea, p. 104.
4. Tamila ANUTGAN, Mustafa ANUTGAN, İsmail ATILGAN, Two-stage Instability Mechanism in Nanocrystalline Silicon TFTs Under Prolonged Gate-bias Stress, 27th International Conference on Amorphous and Nanocrystalline Semiconductors (ICANS27), 21-25 August 2017, Seoul National University, Seoul, Korea, p. 48-49.

Academic Staff

Assist. Prof. Dr. Metin ZEYVELİ

E-mail: mzeyveli@karabuk.edu.tr
Phone: +90 370 418 71 00 / 1108
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Mechanics and Machine Elements, Machine Design, Manufacturing and Machinability, Mechanics Tests, Artificial Intelligence, Optimization, Genetic Algorithms, Clinching Rivet.

Recent Academic Studies

1. Zeyveli M., Karaoğlan K. M. (2015). İmalat Endüstrisinde Durum İzleme Sistemlerinin Geliştirilmesi ve Zeki Denetimli Kullanımı. Güç Aktarım ve Hareket Kontrol Dergisi, 5 (7), Temmuz 2015.
2. Zeyveli M., (2009). A Genetic Approach to Automate Preliminary Design of Gear Drives. Computers & Industrial Engineering, 57(3), 1043-1051, 2009 .
3. Zeyveli M., Sur G. (2017). Investigation of the Machinability of Vanadis 30 Powder Metallurgical Steel with Taguchi Method, The IRES International Conference, Lisbon, Portucal, 11-12 May 2017, pp35-38.
4. Karaoğlan K. M., Zeyveli M. (2016). Talaşlı İmalatta İş Mili Motorunun PID İle Hız Denetiminin Yüzey Pürüzlülüğüne Etkisi. 7th International Symposium On Machining, November 3-5, 2016, Marmara University, Istanbul.

Academic Staff

Res. Assist. Dr. Batıkan Erdem DEMİR
E-mail :bedemir@karabuk.edu.tr
Phone :3704187100 / 1234
Address: Karabuk University, Faculty of Technology,
Department of Mechatronics Eng. Demir Çelik Campus,
78050, Karabük

Research Interests

Computer-assisted Control, Artificial intelligence, Unmanned Aerial Vehicles, Mathematical Modelling of Unmanned Vehicles, Autopilot and Guidance Design, System Identification, Robotics

Recent Academic Studies

1. B. E. Demir, R. Bayır, F. Duran, “Real-Time Trajectory Tracking of an Unmanned Aerial Vehicle Using a Self-Tuning Fuzzy PID Controller”, International Journal of Micro Air Vehicles, vol. (8) 4, pp. 252-268, 2016.
2. İ. Çayıroğlu and B. E. Demir, “Computer assisted glass mosaic tiling automation”, Robotics and Computer-Integrated Manufacturing, vol. (28) 5, pp. 583-591, 2012.
3. F. Demir, B. E. Demir, “Internet Controlled Electronic Scoreboard Desing”, 6th International Conference on Advanced Technology & Sciences (ICAT'Riga), 2017.
4. B. E. Demir, R. Bayır, “Modeling and Control of an Unmanned”, 4th International Conference on Advanced Technology & Sciences (ICAT'Rome), 2016.

Academic Staff

Assist. Prof. Dr. Rafet DURGUT

E-mail: rafetdurgut@karabuk.edu.tr
Phone: +90 370 418 90 52/ 9052
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Computer Science, Artificial Intelligence

Recent Academic Studies

1. 1. Çelik E., Durgut R., "Performance enhancement of automatic voltage regulator by modified cost function and symbiotic organisms search algorithm", , vol.21, pp.1104-1111, 2018
2. Durgut R., Kutucu H., "Silah Hedef Atama Problemi için Tavlama Benzetimli Bir Hibrit Yapay Arı Kolonisi Algoritması", Süleyman Demirel Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 2018
3. Türker İ., Durgut R., Findik O., "Analysis of the Co-authorship Network of Turkish Engineering Research Society", International Conference on Advanced Technologies, Computer Engineering and Science (ICATCES'18)
4. Durgut R., Kutucu H., Akleylek S., "An Artificial Bee Colony Algorithm for Solving the Weapon Target Assignment Problem", The 7th International Conference on Information Communication and Management, Moskova, RUSYA, , pp.28-31

Academic Staff

Res. Assist. Kadriye ÖZ

E-mail :kadriyeoz@karabuk.edu.tr

Phone :3704187100 / 1122

Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Image Processing, Machine Learning, Parallel Programming

Recent Academic Studies

1. Öz, K. , GÖRGÜNOĞLU, S., 2016. Video Gözetim Sistemlerinde Anomali Tespiti Üzerine Bir Derleme. El-Cezeri Fen ve Mühendislik Dergisi, 3 (3), 0-0.
2. Görgünoğlu, S., Öz, K., Çavuşoğlu, A., 2016. CUDA Based Speed Optimization of the PCA Algorithm. TEM J. 5, 152–159. doi:10.18421/TEM52-05
3. Öz, K., Görgünoğlu, S., 2016. Anomaly Detection System With Optical Flow Method, in: 2nd International Conference on Science, Ecology and Technology-2016 (ICONSETE'2016). p. 490.
4. Öz, K., Karaş, İ. R., 2017. Anomaly Detection with Structural Similarity and Optical Flow Histogram. in:Akıllı Sistemlerde Yenilikler ve Uygulamalar (ASYU) Konferansı ASYU 2017, Alanya. p.53.

Academic Staff

Res. Assist. Mustafa Feyzi TEMEL

E-mail :feyzitemel@karabuk.edu.tr
Phone :3704187100 / 1035
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Artificial Intelligence, Deep Learning, Robotics, Electric Vehicles and Technologies

Academic Staff

Semih PAK

E-mail :semihpak@karabuk.edu.tr
Phone :3704187100 / 1297
Address: Karabuk University, Faculty of Technology, Department of Mechatronics Eng. Demir Çelik Campus, 78050, Karabük

Research Interests

Artificial Intelligence, Embedded Systems, Optimization

Mechatronics Engineering

- Laboratories

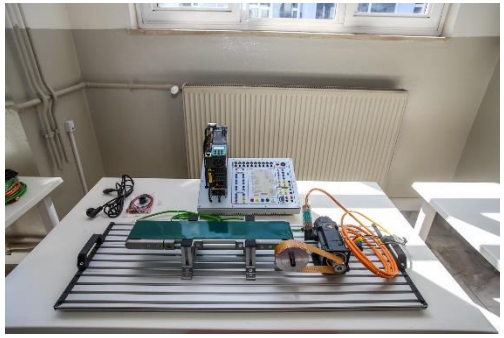
- Robotic Welding Cell Laboratory
- Programmable Logic Controllers Laboratory
- Pneumatic-Electropneumatic Laboratory
- Robotic Laboratory
- Microprocessors and Microcontrollers Laboratory
- Electric Machines Laboratory
- SERVO Laboratory
- Electrical-Electronics Laboratory
- Technical Drawing Laboratory
- Computer Laboratories

Mechatronics Engineering

- Robotic Welding Cell Laboratory

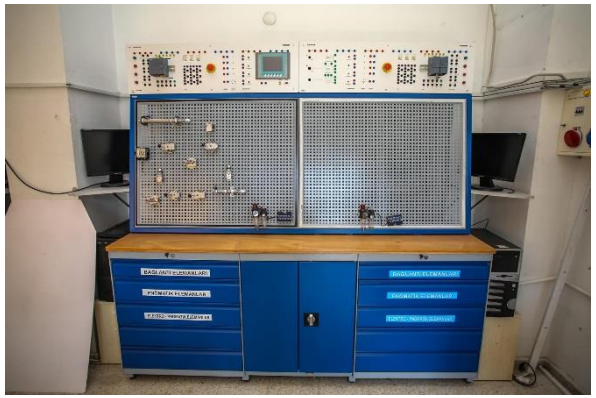
Mechatronics Engineering

- Programmable Logic Controllers Laboratory



Mechatronics Engineering

- Pneumatic-Electropneumatic Laboratory



Mechatronics Engineering

- Robotic Laboratory

Mechatronics Engineering

- Microprocessors and Microcontrollers Laboratory

Mechatronics Engineering

- Electric Machines Laboratory

Mechatronics Engineering

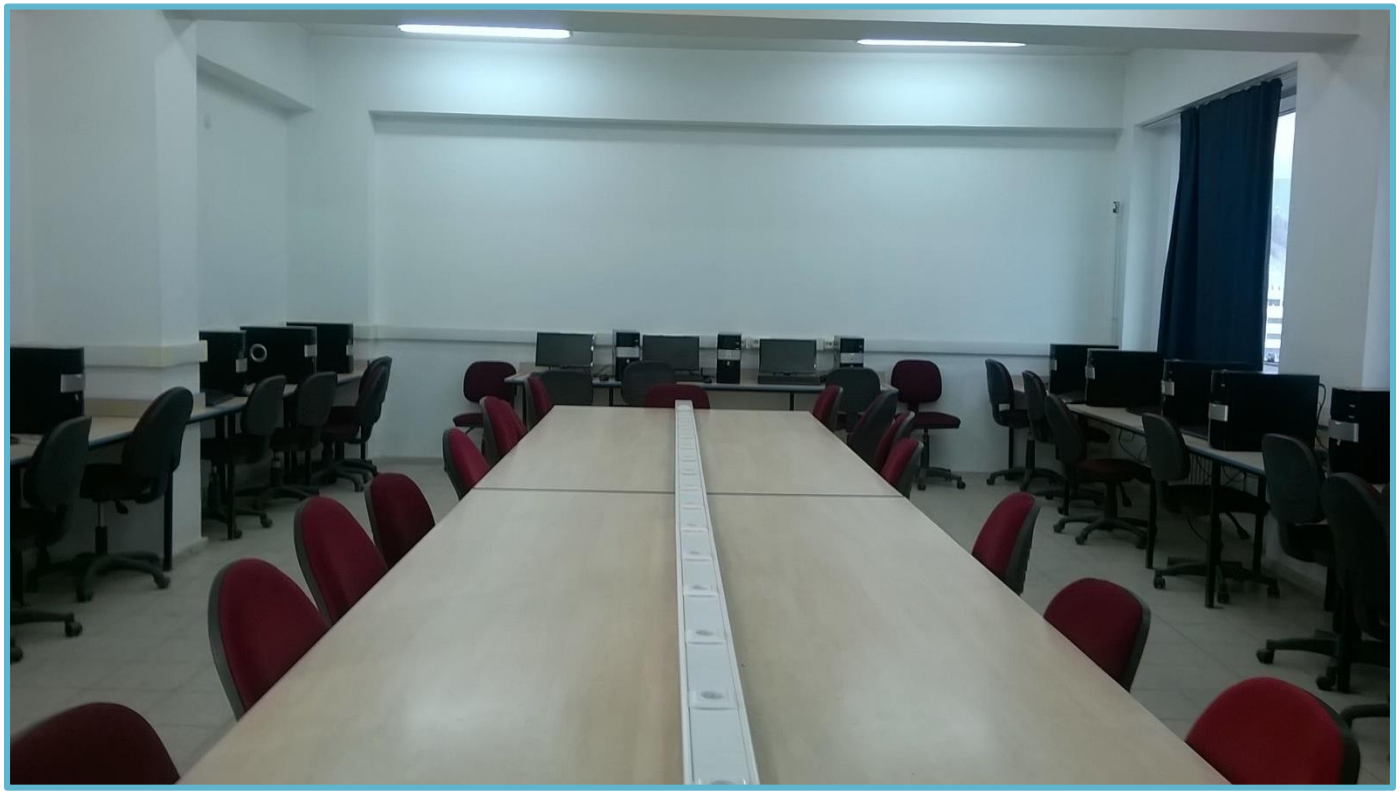
- Electrical-Electronics Laboratory

Mechatronics Engineering

- SERVO Laboratory

Mechatronics Engineering

- Computer Laboratories



Mechatronics Engineering

- Technical Drawing Laboratory

Selected Department Projects

- Project Partner, InFiRo Integrated Physics Approach to Robotics Designed Laboratory, Leonardo Da Vinci Transfer of innovation, 2011-1-HR1-LEO05-00828, Project Coordinator, 2011-2014, (Prof. Dr. Raif BAYIR).
- Intelligent Electronic Control Unit Design and Implementation for Electric Vehicles, Karabük University Scientific Research Project, KBÜ-BAP-16/1-YL-098, Project Coordinator, 2016 – 2017.(Prof. Dr. Raif BAYIR).
- Gülderen A., Anutgan M. Estimation of blood sugar using artificial neural networks,KBÜ-BAP-15/2-YL-014, 2015, (Assoc. Prof. Dr. Mustafa ANUTGAN).
- Demir F., Anutgan M., Energy Harvesting by Piezoelectric Material, KBÜ-BAP-15/1-DR-004, 2017, (Assoc. Prof. Dr. Mustafa ANUTGAN).
- TCM based System for Spindle Motor Realtime Cycle Control in Cnc Workbench Karabük University Scientific Research Project, KBÜ-BAP- 13/2-YL-027, Project Coordinator, 2014 – 2016, (Assist. Prof. Dr. Metin ZEYVELİ).
- Combining Magnesium and Aluminium Alloys which are Used in Automotive and Aviation Sectors with Unrivet Riveting Method and Examining Their Mechanical Behaviours Karabük University, Scientific Research Project, KBÜ-BAP-11/2-YL-018, Project Coordinator, 2012 – 2013, (Assist. Prof. Dr. Metin ZEYVELİ).
- The preparation of metal-polymer-semiconductor (MPS) Schottky diodes with polymer interfacial layer and the investigation their electrical and dielectric properties. Research Project, Researcher, 2012-2013 (National), (Assist. Prof. Dr. Hüseyin TECİMER).

Selected Department Projects

- The preparation and physical properties of Au/Zn-Doped/n-GaAs structures. Research Project, Researcher, 2012-2013 (National), (Assist. Prof. Dr. Hüseyin TECİMER).
- Preparation of the Au/TiO2/n-SiC (MIS) Schottky Diodes and Investigation of Electrical Properties. Research Project, Researcher, 2011-2012 (National), (Assist. Prof. Dr. Hüseyin TECİMER).
- Preparation of Bi3Ti4O12 structures with Ferroelelectrics interfacial layer and the investigation their electrical properties. Research Project, Researcher, 2011-2012 (National), (Assist. Prof. Dr. Hüseyin TECİMER).
- Controller Design for a Six Legged Robot with FPGA, TUBITAK-1002, Researcher, 2015-2016, (Assist. Prof. Dr. Hüseyin Oktay ERKOL).
- A VHDL Application for Kinematic Equation Solutions of Multi-degree-of-freedom Systems, Scientific Research Department of Karabuk University, KBÜ-BAP-13/1-DR-011, Researcher, 2013-2015, (Assist. Prof. Dr. Hüseyin Oktay ERKOL).
- Intelligent Controlled Electronic Differential Design and Implementation for Electric Vehicles, Karabük University, Scientific Research Project,KBÜ-BAP-14/2-DS-046, Project Researcher, 2017, (Res. Assist. Dr. Emel SOYLU).
- Determining Optimal Charge and Discharge Conditions of Batteries with Artificial Intelligence and Condition Monitoring , Karabük University, Scientific Research Project, KBU-BAP-13/1-DR-005, Project Researcher, 2015, (Res. Assist. Dr. Emel SOYLU).
- Detection of Road and Railroad Networks in Synthetic Aperture Radar Images by using Various Methods, Ankara Yıldırım Beyazıt Üniversity, Preliminary Scientific Research Project, Project Number:631, Researcher, 2014-2015, (Res. Assist. Dr. Şafak ALTAY AÇAR).

Awards

- **Drone İHA Awards**
- 2019 - Çankaya Üniversitesi Robot Yarışması – Champion
- 2019 - İTÜ Robot Yarışması– Champion

- **Electromobile Awards**
- 2016 – Efficiency Challenge Electric Vehicle – Domestic Award
- 2015 – Efficiency Challenge Electric Vehicle – Domestic Award
- 2014 – Efficiency Challenge Electric Vehicle – The Best Design Award
-
- **Sumo Robot Awards**
- 2016 – Fujisoft International Robot Sumo Tournament – Champion
- 2016 – Fujisoft International Robot Sumo Tournament – Runner up
- 2015 – Fujisoft International Robot Sumo Tournament – Champion
- 2014 – Fujisoft International Robot Sumo Tournament – Runner up
- 2017 – International MEB Robot Competition – Sumo Robot – Champion
- 2017 – International MEB Robot Competition – Sumo Robot – 3rd Place
- 2016 – International MEB Robot Competition – Sumo Robot – 3rd Place
- 2015 – International MEB Robot Competition – Sumo Robot – Champion
- 2015 – International MEB Robot Competition – Sumo Robot – 3rd Place
- 2014 – International MEB Robot Competition – Sumo Robot – Champion
- 2016 – International METU Robots Days – Sumo Robot – Champion
- 2015 – International METU Robots Days – Sumo Robot – Champion
- 2014 – International METU Robots Days – Sumo Robot – Runner up

Awards

- **Line Following Robot Awards**
- 2017 – International METU Robots Days – Line Following Robot – Runner up
- 2017 – International METU Robots Days – Line Following Robot – 3rd Place
- 2016 – International MEB Robot Competition – Fast Line Following Robot – 3rd Place
- 2016 – Gediz Robots Days – Line Following Robot – Champion
- 2016 – Gediz Robots Days – Line Following Robot – Runner up
- 2016 – Gediz Robots Days – Line Following Robot – 3rd Place
- 2016 – Saf-Run Robots Days – Line Following Robot – Champion
- 2016 – Saf-Run Robots Days – Line Following Robot – Runner up
- 2016 – Saf-Run Robots Days – Line Following Robot – 3rd Place
-
- **Open Project Awards**
- 2016 – Marmara University, MIG – Open Project – Champion
- 2016 – Marmara University, MIG – Open Project Task Completion – Runner up
- 2016 – Saf-Run Robots Days – Open Project – Champion
- 2014 – International METU Robots Days – Open Project – Champion
- 2014 – International MEB Robot Competition – Open Project – Champion

Employment Fields

- System setup, system maintenance and process improvement in various factories.
- In military fields, mobile air/ground vehicles, smart weapon systems , smart defence systems design and production companies
- Automation and various process control systems development companies
- Electronic card and software development companies
- Robotic technology development companies
- Automotive, biomedical, agriculture technology development and usage companies

Mechatronics Engineering

- Contact Information

Postal address: Karabük University, Faculty of Technology, Department of Mechatronics Engineering, Demir Çelik Campus, 78050, Karabük

- Department web page:

http://teknoloji.karabuk.edu.tr/mekatronik
http://teknoloji.karabuk.edu.tr/mekatronik-en

- E-mail: teknolojifakultesi@karabuk.edu.tr