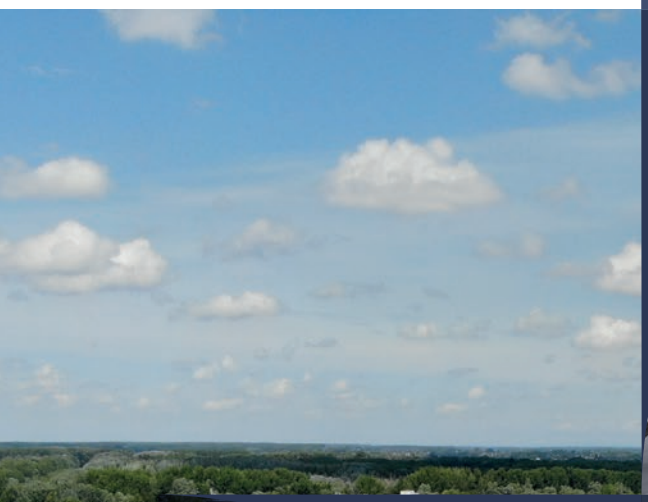
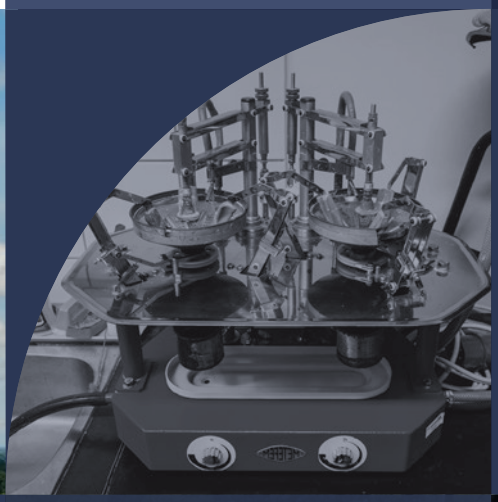
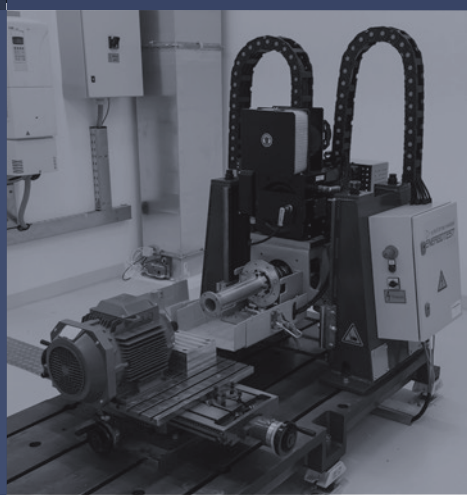
SZÉCHENYI EGYETEM
UNIVERSITY OF GYŐR

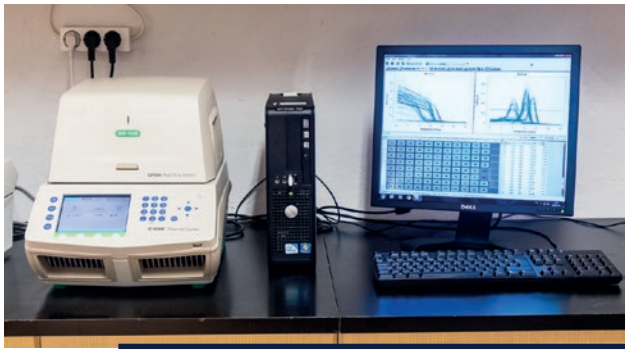
LABORATORY CATALOG

Table of contents

Animal Genetics Laboratory

TESTING LABORATORY

The Animal Genetics Laboratory is primary used to identify genetic markers (genotypes) that affect the production of farm animals (pigs, poultry, cattle and sheep). Furthermore it implements gene expression assays in various animal tissues.



9200 Mosonmagyaróvár, Vár tér 2.
B Building, A7.
ansci.sze.hu

Head of laboratory | Dr. Bali Papp Ágnes
+36-96-566-613 / +36-70-269-3069
bali.papp.agnes@sze.hu

Applied Mechanics Laboratory

TESTING LABORATORY

Within the world of mechanical tests, measurements and research, the main field of Applied Mechanics Laboratory is strain gauge measurements. This is not “just” a tool. In addition to examining surface deformation, this device is also used in force and weight measuring, torque measuring or even some displacement and acceleration measuring sensors. Our laboratory also deals with the entire measurement process, which includes design, application, and the performance and evaluation of static or dynamic measurements with or with sensors made with this technology. We are proficient in static and dynamic measurement on organic and inorganic materials, even with a larger number of channels.

9026 Győr, Egyetem tér 1.
L2 / 3.
amt.sze.hu

Head of laboratory | Nagy Attila
+36-96-503-400 extension: 3325 / +36-20-240-3381
nagy.attila@ga.sze.hu

Audio-Video Research Laboratory

TESTING LABORATORY

The main focus of the Audio-Video Research Laboratory includes ap- plied research and measurements on the field of acoustics, image processing and virtual reality. A semi-anechoic (sound proof) cham- ber for dedicated measurements and sound recording purposes is also availible.

9026 Győr, Egyetem tér 1.
L1 / 119-120.

Head of laboratory | Dr. Wersényi György
+36-96-613-523 / +36-20-993-2173
wersenyi@sze.hu

Autonomous and Intelligent Robotics Laboratory

RESEARCH LABORATORY

In addition to industrial robots the Autonomous and Intelligent Robotics Laboratory deals with a wide range of modern robotics, as well as research and development of autonomous vehicles, service robots and collaborative systems. The main research and development directions: intelligent control of robots, human-machine cooperation tasks, sensor fusion and machine vision applications. The laboratory is well equipped for R&D tasks, both in hardware and software, with modern instruments, tools and basic elements for robotic construction. The laboratory also offers courses for programming and operating of industrial and mobile robots.

9026 Győr, Egyetem tér 1.
ÚT/108.
automatizalas.sze.hu

Head of laboratory | Dr. Ballagi Áron
+36-96-503-462 / +36-30-235-6775
ballagi@ga.sze.hu

Building Materials Testing and Building Physics Laboratory | TESTING LABORATORY

The activities of the Building Materials Testing and Building Physics Laboratory cover a wide range, which includes commissioned product testing: the first type testing performed within the framework of the construction product performance constancy testing; expert activities; application testing of construction products; internal and external research and development activities; on-site inspections; building diagnostic tests; qualification tests; and technical development, consulting and other work.

9026 Győr, Egyetem tér 1.
L4/8.
eet.sze.hu

Head of laboratory | Pollák András
+36-96-503-454 / +36-30-997-3153
pollak.andras@ga.sze.hu

Cable Communication Systems Laboratory | RESEARCH LABORATORY

The Laboratory of Cable Communication Systems is designed for students to gain knowledge of the various cable communication systems and for performing measurements related to their services, analog and digital program broadcasting, IP-based data transmission, and IP-based program broadcasting on the built measurement network.

9026 Győr, Egyetem tér 1.
D/711.
kabelkomlab.sze.hu

Head of laboratory | Dr. Derka István
+36-96-613-641 / +36-30-659-6198
kabelkomlab@ga.sze.hu

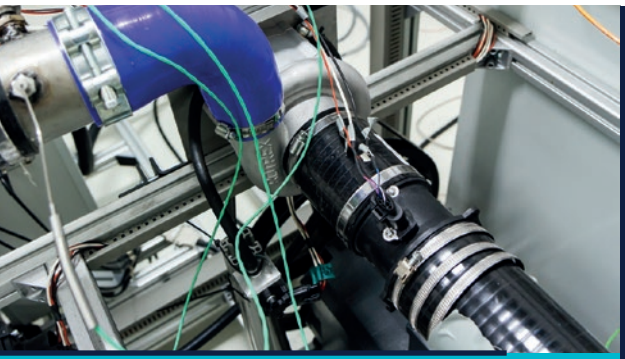
CNC Machining Laboratory

RESEARCH LABORATORY

The CNC Machining Laboratory is involved in the production of machines and equipment parts. CNC machining operations such as turning, milling and drilling can be performed there. The CNC Machining Laboratory is also involved in the preparatory work for the testing of mechanical products and materials.

9026 Győr, Egyetem tér 1.
L2/10-A
jt.sze.hu/cnc

Head of laboratory | Hegyi Norbert
+36-96-503-400 extension 3134
hegyi.norbert@sze.hu



Component Test Laboratory

TESTING LABORATORY

The component test laboratory allows to model and test the dam- age and wear of the turbocharger tribology system (bearings and shaft) due to different loads, as well as the service life of the com- ponent in different operating conditions. The operating conditions (temperature, lubrication, rotational speed) can be accurately set. And as an additional feature of the test bench it can be used for experiments in the field of thermodynamic and acoustic inves- tigations.

9026 Győr, Egyetem tér 1.
JL/0.11.
bmt.sze.hu

Head of laboratory | Pesthy Márk
+36-96-613-574/+36-70-883-4180
pesthy.mark@ga.sze.hu

Cutting Laboratory

RESEARCH LABORATORY

The Machining (Cutting) Laboratory is involved in the production of machine and equipment parts. Machining operations such as turning, milling, drilling, grinding and sawing can be performed there. It also plays an important role in the preparatory work for the production or the testing of mechanical products and materials. It can cooperate with other laboratories, such as the CNC Machining Laboratory.

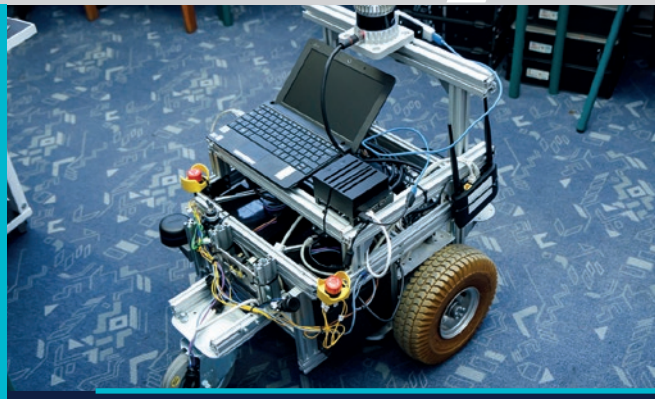
9026 Győr, Egyetem tér 1.
L3/13.
jt.sze.hu/forgacsolo-laboratorium-1

Head of laboratory | Titrik Péter
+36-96-503-400 extension: 3344
titrikpeter@gmail.com

Cyber-Physical Systems Laboratory

TESTING LABORATORY

In the Cyber-Physical Systems Laboratory, it is possible to develop Industry 4.0 solutions based on cyber-physical devices. The laboratory is suitable for the complex development of products that can navigate indoors, completely autonomously or in a controlled automated way without changing the environment as well as for development of AI-based complex automation solutions.



9026 Győr, Áldozat u. 12.
Building of Law/S5.
kifi.sze.hu

Head of laboratory | Dr. Kovács János
kovacs@sze.hu

Cyber-Physical Manufacturing Systems Laboratory | RESEARCH LABORATORY

9026 Győr, Egyetem tér 1.
ÚT/110.
jt.sze.hu

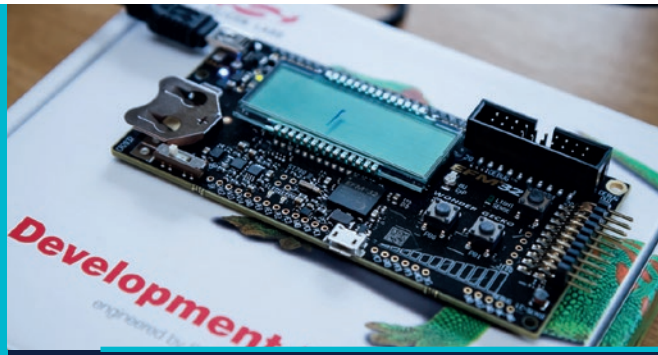
Head of laboratory | Szántó Norbert
+36-96-503-400 extension: 3143
szanto@sze.hu

The main activities of the Cyber-Physical Manufacturing Systems Laboratory can be divided into the following groups of tasks:

- Situation-aware, resource-efficient and robust production planning and control.
- Design of demonstration mini production and logistics systems using I4.0 solutions.
- Design and operation of cooperative and adaptive production and logistics networks.
- Design of robust cooperative Cyber-Physics systems.
- Design of I4.0 solutions to support energy efficient and sustainable manufacturing.

DSP Sound and Image Processing Laboratory | RESEARCH LABORATORY

In the DSP Sound and Image Processing Laboratory, it is possible to learn the basics of digital signal processing and the application of the Matlab software package, as well as the methods of simulating electronic circuits.
The DSP Sound and Image Processing Laboratory is suitable for the analysis of two- or multidimensional discrete distributions, like images, mainly of medical, mechanical and electronic origin, and for the development of classification and analysis algorithms. These algorithms can be based on human expert knowledge or self-learning depending on to the task and patterns. Internationally recognized results were obtained by the laboratory using wavelet and entropy-based methods.



9026 Győr, Egyetem tér 1.
L1/109.
tat.sze.hu/dsp-hang-es-kepfeldolgozo-labor

Head of laboratory | Dr. Nagy Szilvia
+36-96-503-400 extension: 3220 /+36-30-747-9367
nagysz@sze.hu

Electric Powertrain Testbench Laboratory | TESTING LABORATORY

The Electric Powertrain Testbench Laboratory is able to test electrical machines on different power levels. The high-performance testbench can currently be tested with a measuring range of 250 Nm and 4000 rpm (by brake machine, but this range can be modified with a gearbox). On the low-power testbench can perform drive tests up to 5 kW in the range of 100 Nm and 800 rpm. It is also possible to perform other task-dependent tests on the own developed testbench systems.

9026 Győr, Egyetem tér 1.
L2/ K5.
jkk.sze.hu/fooldal

Head of laboratory | Kőrös Péter
+36-96-503-400 extension: 3055/ +36-30-335-0401
korosp@ga.sze.hu

Electrical Machines and Drives Laboratory | RESEARCH LABORATORY

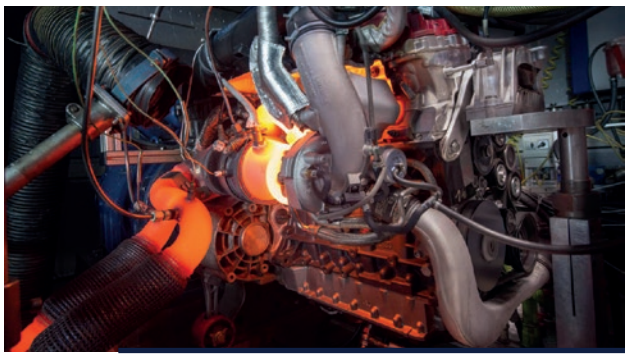
The Electrical Machines and Drives Laboratory has 8 safe, user-friendly testbenches. It also has 2 high-demand, overloadable testbenches, which are also suitable for industrial orders.

9026 Győr, Egyetem tér 1.
JL/ 2.16.

Head of laboratory | Németh Zoltán
+36-96-503-400 extension 4390
emobilitas@sze.hu

Engine Test Beds | TESTING LABORATORY

The Engine Test Beds provides comprehensive testing of internal combustion engines and measurement of combustion process, engine dynamics, friction, wear, and emissions. The laboratory has two full-function engine test beds and one friction measurement test bed. The operation of the test beds is assisted by equipped preparatory workshops. In the laboratory, it is also possible to perform full scale tests of internal combustion engines and of individual components separately. On the test beds, a complete measurement of the emissions of internal combustion engines can also be performed.



9026 Győr, Egyetem tér 1.
BMT/ 0.06., 0.09.
bmt.sze.hu/motorfekpad

Head of laboratory | Nagy Gábor
+36-30-622-7356

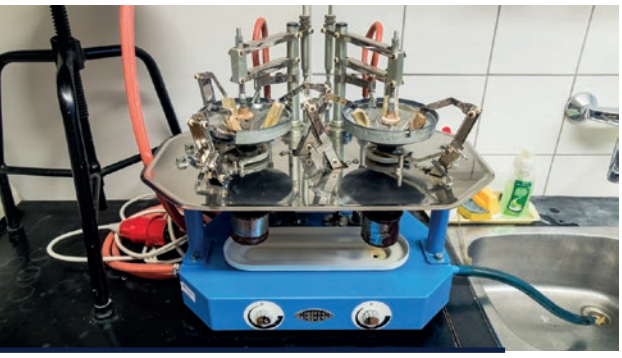
Feed Analyzing Laboratory

TESTING LABORATORY

The Feed Analyzing Laboratory perform the tests necessary to determine the chemical composition of feed samples. The laboratory is also equipped to determine the quality properties of products of animal origin (milk, meat, eggs).
In addition, the background of the laboratory's measurement technology and measurement preparation (machinery, measuring instruments, software) is undergoing continuous development in order to be able to meet the emerging needs.

9200 Mosonmagyaróvár, Vár tér 4.
B Building, F4., F5., F6.

Head of laboratory | Takács Georgina
+36-96-566-624, +36-96-566-615
takacs.georgina@sze.hu



Flour Evaluation Laboratory

TESTING LABORATORY

The Flour Evaluation Laboratory provides the possibility to analyze the quality of cereal grains (such as fall number, determination of moisture content, gluten test, Zeleny test, valorographic examination). Within this, the examination of quality and shape properties of flour, dough and bread are also available. It is possible to measure hectoliter weight and to bake sample loafs.

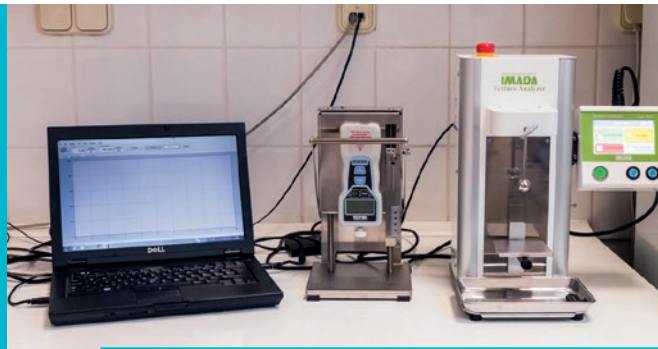
9200 Mosonmagyaróvár, Vár tér 2.
B Building, F9.
plant.sze.hu

Head of laboratory | Dr. Molnár Zoltán
+36-96-566-748 / +36-70-247-5578
molnar.zoltan@sze.hu

Food and Water Testing Laboratory

TESTING LABORATORY

The Food and Water Testing Laboratory provides excellent conditions for project work and assignments from the industrial sector. In addition to classical and molecular biology-based microbiological testing of food, feed, water, and air samples, the BSL II-classified laboratory also performs rheological (viscosity, density, etc.) tests, chemical composition (dry matter, foreign water, alcohol, sugar content, etc.) determinations, and sensory evaluations. It has significant resources for modelling fermenta- tion systems.



9200 Mosonmagyaróvár, Lucsony utca 15-17.
C/0.06-0.17.
food.sze.hu/lab

Head of laboratory | Dr. habil. Ásványi Balázs
+36-96-566-653
asvanyi.balazs@sze.hu

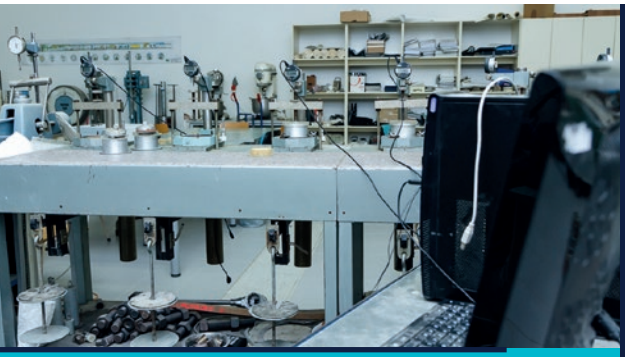
Geoinformatics Laboratory

RESEARCH LABORATORY

The main profile of the Geoinformatics Laboratory is geodetic and GIS activities related to research in the field of transport infrastructure and traffic safety. We are using GIS data collection and high-precision geodetic measurements with modern instruments and tools.

9026 Győr, Egyetem tér 1.
L4/1.
kep.sze.hu/laborok/geoinformatika-laboratorium

Head of laboratory | Hegyi Pál
+36-96-503-400 extension: 3119
hegyip@sze.hu



Geotechnical Laboratory

TESTING LABORATORY

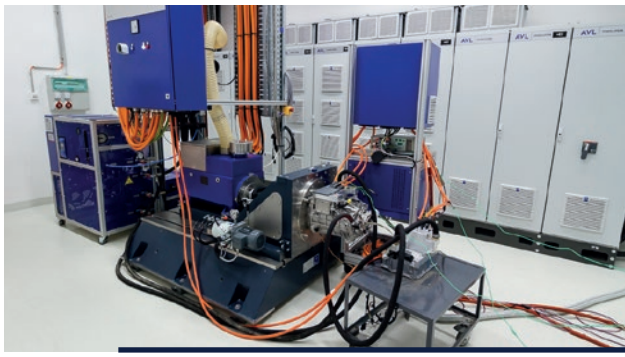
In the profile of the Geotechnical Laboratory, the studies of the mechanical properties of soils give the main direction, with special regards to the parameterization of the advanced constitutive models. In addition to those advanced tests, supplementary soil identification and permeability tests are also carried out. Design, conduction, and evaluation of pile load tests are also a great part of our scope work.

9026 Győr, Egyetem tér 1.
L4/7.
se.sze.hu

Head of laboratory | Hudacsek Péter
+36-30-340-6938
hudacsek@sze.hu

High-Performance Electrical Machine Laboratory | TESTING LABORATORY

There is an AVL testbench in the High-Performance Electrical Machine Laboratory with outstanding, unique technical parameters, capable of a rated power of 400 kW and a maximum speed of 24,000 rpm. The device is suitable for scientific testing of electrical drive systems with a battery emulator (E-Storage, 2x250kW, 8-800V DC).



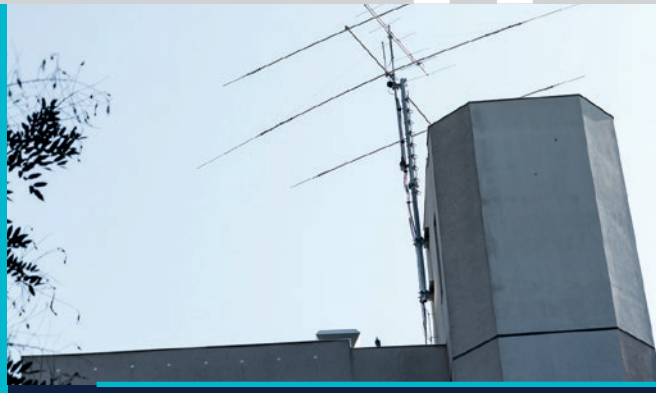
9026 Győr, Egyetem tér 1.
JL/0.18.

Head of laboratory | Németh Zoltán
+36-96-503-400 extension 4390
emobilitas@sze.hu

Honfy József Radioamateur Station

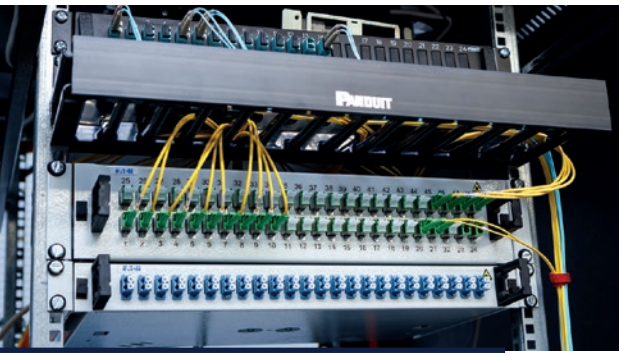
RESEARCH LABORATORY

The Honfy József Radioamateur Station is a competitive short and ultra-short wave amateur radio station with the highest level of examination by the National Media and Communications Authority, which was created courtesy of companies and individuals. With the help of the built optical network, it is able to cooperate with the Space Telecommunications Laboratory.



9026 Győr, Egyetem tér 1.
K4/6th floor
sze-antenna.tilb.sze.hu/amator/index.html

Head of laboratory | Németh Péter Ernő
+36-70-242-9104
ha1khj@sze.hu, radioklub@sze.hu,
nemeth.peter@tilb.sze.hu



IT-Telecommunication Laboratory

RESEARCH LABORATORY

In the IT-Telecommunication Laboratory, students could get familiar with Computer Networks, and future of Telecommunication Technologies, cloud computing, HPC computing storage and virtualization technolnologies. The Lab constantly supports different research projects.

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L1/6-7.
tilb.sze.hu

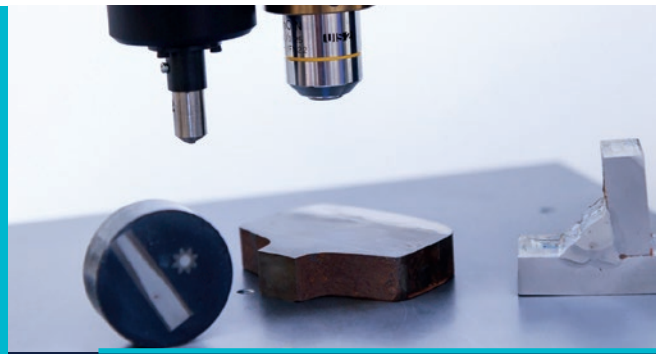
Head of laboratory | Kovács Ákos
+36-96-503-400 extension: 3327 / +36-30-459-9026
kovacs.akos@sze.hu

Material Testing Laboratory

TESTING LABORATORY

The Material Testing Laboratory is mainly concerned with the testing of metals and failure analysis. We perform chemical composition analysis, mechanical, microscopic and non-destructive material and product testing, and qualification of the heat treatment condition.
Accredited testing (MSZ EN ISO / IEC 17025: 2018):

- mechanical tests and microstructure analysis of steels, aluminium and its alloys, castings, - destructive and non-destructive testing of welded joints,
- corrosion and environmental testing (salt spray, thermal shock and resistance to humidity).



9026 Győr, Egyetem tér 1.
L3/23.
anyaglab.sze.hu

Head of laboratory | Dr. Hargitai Hajnalka
+36-96-613-572 / +36-30-315-4030
anyaglab.sze@gmail.com

Metal Additive Manufacturing Laboratory | RESEARCH LABORATORY

The main activity in the laboratory is the additive manufacturing of metals. The most typical applications of metal 3D printing technology are the production of inserts for injection molding tools with conformal cooling channels, the weight reduction of various mechanical parts, as well as rapid prototyping and small series production. The laboratory offers the following services: consulting, education, design, simulation and manufacturing.

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L2/2.
metalprinting.hu

Head of laboratory | Hatos István
+36-30-859-1183
hatos@sze.hu

Packaging and Environmental Testing Laboratory | TESTING LABORATORY

The Packaging and Environmental Testing Laboratory has nearly 800 partners from 40 different countries, accredited according to the MSZ EN ISO / IEC 17025: 2018 standard. Main areas: testing of transport packaging; type testing of dangerous goods packaging; quality control testing of packaging materials; R&D projects; consulting and training; automotive tests.

9026 Győr, Egyetem tér 1.
Packaging laboratory
packlabhu.com

Head of laboratory | Dr. Böröcz Péter
+36-30-190-2889
packlab@sze.hu

Plant Biology Laboratory

TESTING LABORATORY

The Laboratory of Plant Biology is suitable for maintaining a unique strain collection of microalgae, and for the production and biotesting of microalgae biomass. In addition, the laboratory is able to study the physical and chemical properties of surface water samples and, last but not least, the physiological examination of field crops.

9200 Mosonmagyaróvár, Lucsony u. 15-17.
E Building, NBI-1., NBI-2., NBI-3.
plant.sze.hu

Head of laboratory | Dr. Molnár Zoltán
+36-96-566-751 / +36-70-247-5578
molnar.zoltan@sze.hu

Polymer Engineering Laboratory

TESTING LABORATORY

The Polymer Engineering Laboratory has the most important production technologies for thermoplastic polymers. Its main research area is material development and recycling. The laboratory has basic test methods for polymers that are suitable for the validation of developed materials.

9026 Győr, Egyetem tér 1.
L2/5.
polimerlab.sze.hu

Head of laboratory | Dr. habil. Dogossy Gábor
+36-96-503-400 extension: 3273
dogossy@sze.hu

Production Optimization Laboratory

RESEARCH LABORATORY

The Production Optimization Laboratory has software packages suitable for the production- planning, simulation, optimization, ergonomic design, and 3D layout planning. With the help of simulation analyses, the utilization of facilities and machines as well as the performance can be increased, human resource requirements, production time and storage space area can be reduced.
Application possibilities of production simulation:

- Analysis and optimization of an existing facility: daily performance testing, optimization of control strategies, optimization of the sequence of operations, analysis and optimization of logistics and warehousing processes.
- Design of a new facility: determination of time and performance, assessment of human resource needs, definition of possible control strategies, analysis of the occurrence of failures, testing of different variants.

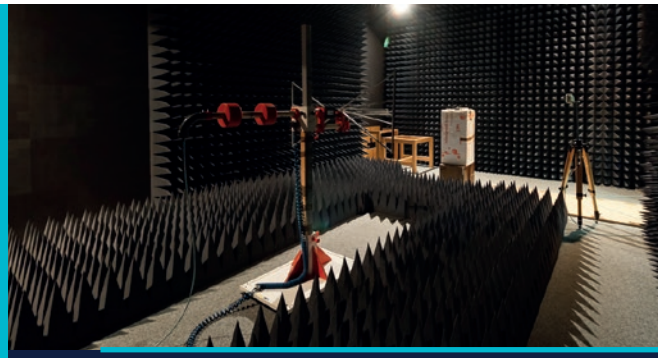
9026 Győr, Egyetem tér 1.
ÚT/112.
jt.sze.hu

Head of laboratory | Szántó Norbert
+36-96-503-400 extension: 3143
szanto@sze.hu

Radiofrequency Test Laboratory

TESTING LABORATORY

The Radiofrequency Test Laboratory provides an opportunity for electrotechnic-, information-, telecommunication and radio equipment (including standalone and complete systems) EMC directive compliance testing. The RED and EMC directive is to be applied, even if a device that already has a CE marking is integrated inside another product. That is why a product, that is assembled from multiple CE marked units, the whole EMC and RED testing must be carried out for the new product to receive a CE marking. We provide development support- and compliance testing for CE certification and recertifi according to directives standards, with accredited (MSZ EN ISO/IEC 17025:2018) or not accredited test reports. Furthermore we undertake the complete CE certification process and the complete organization of the directive relevant development support-, verify and compliance tests (RED, EMC, LVD, Safety&Health).



9026 Győr, Egyetem tér 1.
L3/20.
rf.sze.hu

Head of laboratory | Drotár István
+36-96-613-693/+36-30-532-0557
info@rf.sze.hu

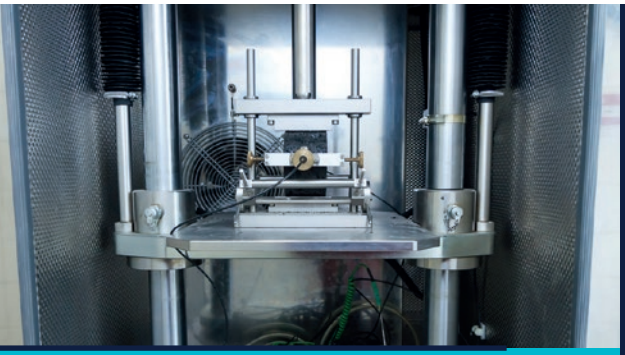
Research Electrical Laboratory

TESTING LABORATORY

The Research Electrical Laboratory is made for study electrical rotating machines and drive systems. The 50 kW rated power dynometer with the 10,000 rpm maximum speed allows a higher level scientific examination of drive systems.

9026 Győr, Egyetem tér 1.
JL / 2.17.

Head of laboratory | Németh Zoltán
+36-96503-400 extension 4390
emobilitas@sze.hu



9026 Győr, Egyetem tér 1.
L4 / 6.
kep.sze.hu

Head of laboratory | Nagy Richárd
+36-96-503-400 extension: 3139 /+36-30-824-8526
nagy.richard@sze.hu

Road Construction Laboratory

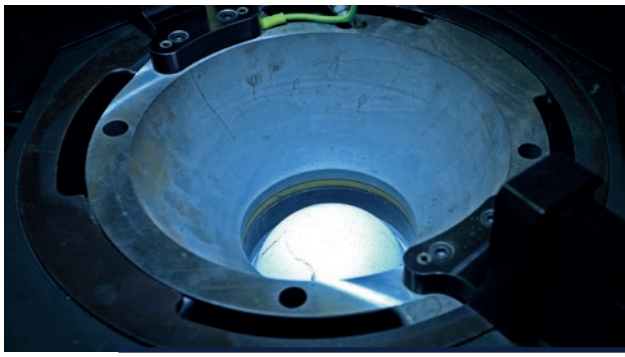
TESTING LABORATORY

The main profil of the Road Construction Laboratory is the examination of the conformity of materials to be incorporated during road construction. Our laboratory has a floor area of 200 m^2, we have a number of equipment with which we can perform mechanical tests of asphalts, bitumen tests, visibility tests and nondestructive georadar diagnostic tests. The staff of our laboratory has significant experience in the field of research development, expert and consulting, construction and technical inspection related to road construction. Our goal is to expand our range of tests across the current cross-section to the widest possible spectrum.

Sheet Metal Technologies Laboratory

TESTING LABORATORY

The Laboratory of Sheet Metal Technologies can take different courses or trainings on the press machines. There can be testing rapid prototype tools and can optimize different sheet metal forming processes. In addition, in the laboratory can preform the traditional Erichsen cup drawing test, pulling test, deep drawing test and forming limit diagram test with modern DIC technique.



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Head of laboratory | Szalai Szabolcs
+36-96-503-400 extension: 3396
szalai.szabolcs@ga.sze.hu

Soil Testing Laboratory

TESTING LABORATORY

The Soil Testing Laboratory provides the examination of the nutrient content of soil samples as well as certain parameters necessary for the physical, physico-chemical and chemical characterization of the soil. These tests are carried out by the laboratory primarily in accordance with the requirements of agrienvironment schemes, regulations on the protection of surface and groundwater against nitrate pollution of agricultural origin, and regulations of the Ministry of Agriculture.

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Space Telecommunications and Space Research Laboratory | RESEARCH LABORATORY

The Space Telecommunications and Space Research Laboratory fully meet the requirements of today in terms of electricity network, internal equipment, telecommunication devices and security equipment. Its main activity is the introduction of space telecommunications and space research activities, as well as the practical presentation and application of telecommunications and microwave knowledge.

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Structural Engineering Laboratory

TESTING LABORATORY

The Structural Engineering Laboratory is located in a 220m^2 place with top running overhead crane (capacity: 10 tons) and an external industrial gate. The main profil of the laboratory is the study of construction and transport structures. In the laboratory there are avalible an universal testing machine (load capacity: 400 kN) and a bending machine (load capacity of 150 kN) for testing smaller structures and models. Larger structures are tested using load frames with a capacity of 1000 kN. It is possible to measure elements up to 15 m long and 2 m high in the main loading zone. The measuring range of the load cells is 200 kg - 2000 kN, the movements can be recorded with displacement sensors with the accuracy of 0.001 mm, the measuring range is up to 400 mm. For dynamic measurements, a 15 kN and a 300 kN dynamic testing machines, as well as impulse hammers are available. The dynamic tests are performed with single- and multi-axis accelerometers. The laboratory's measurement technology and measurement preparation background (machinery, measuring instruments, softwares) is undergoing continuous development in order to be able to meet the emerging needs. Thanks to the modular and mobile machinery of the laboratory, it is also possible to measure built-in structures.

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Surface Analysis Laboratory

TESTING LABORATORY

The primary activity of the Surface Analysis Laboratory is to support tribological experiments. Other activities of the laboratory includes failure and damage analysis of parts, surface topography analysis of parts, geometric examination of parts, laboratory weighing.

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Surface Digitization and Length Measurement Laboratory

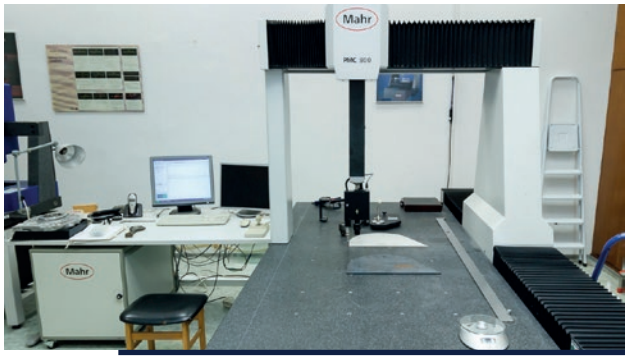
TESTING LABORATORY

The Laboratory of Surface Digitization and Length Measurement work with the equipment of the GOM company. Its main activities include 3D coordinate measurement or 3D optical surface ditiziation. ATOS systems can also be used in a variety of industries, such as sheet metal parts, tools and castings, turbine blades, prototypes, injection molded and cast parts. In addition, with Argus systems, the laboratory inspects sheet metal components and helps optimize sheet metal forming processes. The sensors of the ARAMIS product family are suitable for the dynamic measurement of 3D coordinates, 3D displacement and 3D surface deformation.

Three-coordinate Measuring Laboratory

TESTING LABORATORY

The Three-coordinate Measuring Laboratory has a coordinate measuring machine, a roundness and a roughness tester, which are particularly suitable for geometric measurements in the vehicle industry. The laboratory also has numerous hand-held measuring devices and references for geometric measurements. Measurements are carried out in the laboratory for companies that cannot carry out these meas- urements themselves due to a lack of equipment or staff. Often meas- urement orders come from abroad.



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Tribology Laboratory

TESTING LABORATORY

The main purpose of the Tribology Laboratory is the tribological (friction and wear) characterisation and development of several internal combustion engine components (engine parts, lubricants and fuels). The laboratory is equipped to experimentally compare different surface coating materials, lubricant samples, research materials and their machining process.

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Turbocharging Laboratory

TESTING LABORATORY

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The Turbocharging Laboratory makes it possible to map the real conditions and loads of turbochargers of different sizes and types. Its main aim is to offer-specifically turbocharger-optimized measurements and tests in a time- and cost-effective way. Using extremely precise control technology, the test bench provides the ability to create compressor / turbine maps as well as a wide range of temperature, pressure and other parameter settings. An outstanding potential is the feasibility of dynamic, long-lasting heat loading processes, in which the maximum temperature value can reach 1200 °C. All this can be done by installing two turbochargers of the same type at the same time. During this type of test, the material ageing process of turbine housing due to thermal fatigue can be observed. In order to examine the conditions and different loads of the multistage charging, the test bench has a specially developed unit with which a pressure and temperature control can be established in a wide range of volume flows. The test bench also allows controlling the lubrication and cooling system of the turbocharger. The backpressure of the exhaust systems of internal combustion engines can be simulated by integrating them directly into the so-called "backpressure unit" system after the turbine.

Vehicle Development Laboratory

RESEARCH LABORATORY

In practice, the Vehicle Development Laboratory supports noise and vibration analysis (NVH); thermo management; activities in the field of energy management and strength and life analysis. The laboratory offers the following activities:

- continuous optimization of automotive technologies with state-of-the-art simulation and optimization techniques
- conduct innovative acoustic improvements to optimize comfort and external noise levels

The laboratory is equipped with 4 vibration excitation “shaker” LMS data recording systems for vibration analysis, a hot-wire measuring head and a Schlieren system for flow measurements. In the workshop of the laboratory, welding equipment and various metalworking machines help carry out the measurements.

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Vehicle Diagnostics Laboratory

RESEARCH LABORATORY

The main purpose of the Vehicle Diagnostics Laboratory is to carry out certain measurements and diagnostic processes of vehicles: measuring the brake system, dampers, performance, serial diagnostics, diagnostics of hybrid and electric vehicles, tyre pressure monitoring systems, suspension geometry and setup as well as emissions measurements. The inspection pit, designated workplaces and tools all found in this laboratory can be utilized for the fitment of different sensors, stationary measurements and inspections of various autono- mous vehicle projects.

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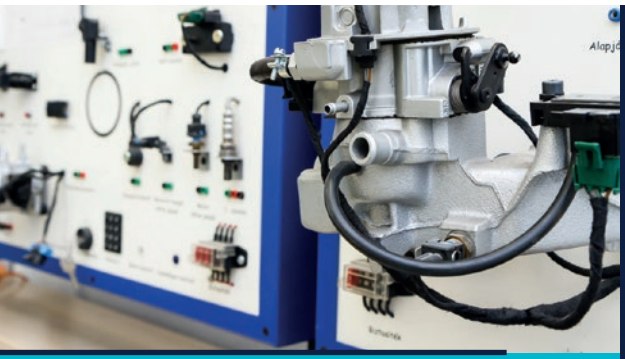

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Vehicle Electricity and Electronics Laboratory | RESEARCH LABORATORY

The Laboratory of Vehicle Electricity and Electronics provides the necessary conditions for the acquisition of the theory and practice of vehicle electricity and vehicle electronics. Development activities can be performed in the laboratory on electric autonomous vehicles for which it also has enough place for one vehicle and a lifting equipment. It also supports the solution of electronics, communication and vehicle control tasks for modern and alternative propulsion vehicles.

Vehicle Energetics Laboratory

RESEARCH LABORATORY

The Vehicle Energetics Laboratory aims to showcase the electric machines and their control units used in alternative-drivetrain and fully electric vehicles. Its goal is to support the research of vehicles utilizing an electric drivetrain through measurements and test bench processes. Furthermore, the laboratory also carries out examinations of the loading and discharging processes of batteries, as well as solar cells.

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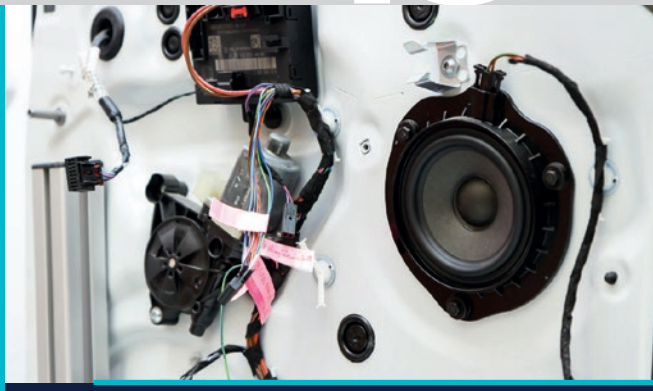
Vehicle Mechatronics and Intelligent Vehicles Laboratory | RESEARCH LABORATORY

In the Vehicle Mechatronics and Intelligent Vehicles Laboratory, it is possible to learn about and learn how to use Labview software. In addition, 10 educational mechatronics modules (headlights, fuel tanks, window regulators) are available, which can also be connected to the Labview software environment using NI multifunction data acquisition cards. The lab also has a prototype electronic panel assembly department.



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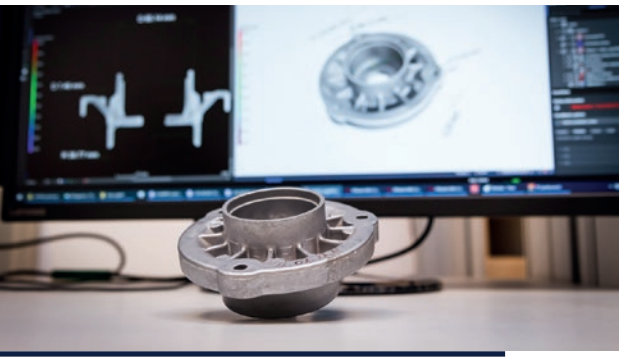

X-ray CT Laboratory | TESTING LABORATORY

The X-ray CT Laboratory is operating the first ever high power industrial CT installed in Hungary. Nondestructive testing of cast parts for internal defects, analysis of individual parts of assembled objects and metrology are just some examples of the multitude of capabilities of the laboratory.

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The description of the tests performed by the laboratories, research capacity and detailed list of the tools available on the website **szolgaltatas.sze.hu/laboratories**.