

CONFERENCE PROGRAM

THE 11th INTERNATIONAL CONFERENCE ON ADVANCED CONCEPTS IN
MECHANICAL ENGINEERING

ACME2024

JUNE 6 – 7, 2024
IAȘI, ROMANIA



Organized by:
FACULTY OF MECHANICAL ENGINEERING
"GHEORGHE ASACHI" TECHNICAL UNIVERSITY OF IAȘI
and
**ROMANIAN ACADEMY OF TECHNICAL
SCIENCES**



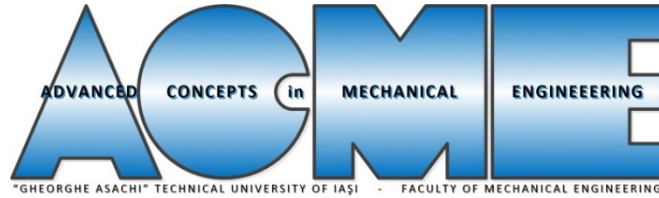
Under the aegis of:

ROMANIAN MINISTRY OF EDUCATION
ACADEMY OF ROMANIAN SCIENTISTS

In partnership with:

SRR - ROBOTICS SOCIETY OF ROMANIA
SRT - ROMANIAN SOCIETY OF THERMODYNAMICS
SIAR - SOCIETY OF AUTOMOTIVE ENGINEERS OF ROMANIA
AROTMM - ROMANIAN ASSOCIATION FOR MECHANISMS AND MACHINE SCIENCE
AFCR - ROMANIAN ASSOCIATION FOR REFRIGERATION AND CRYOGENICS ENGINEERS
SROMECA - ROMANIAN ASSOCIATION OF MECHATRONICS
ART - ROMANIAN TRIBOLOGY ASSOCIATION





CONFERENCE PROGRAM OUTLINE

Thursday, June 6th, 2024

09:00 – 09:30 Participants Registration (TUIASI Aula)

09:30 – 10:00 Welcome, Conference Opening Ceremony

10:00 – 11:00 Plenary Session (TUIASI Aula)

1. Innovations in Biomedical Implants: Enhanced Osteointegration and Anti-Infection Surface

Giullietta Rau – Institute of the Structure of Matter of the Italian National Research Council, Rome, Italy

2. COLIBRI: A Hummingbird Robot

André Preumont – Université Libre de Bruxelles, Belgium

11:00 – 11:30 Visit to the Central Library of TUIASI

12:00 – 13:00 Lunch Break (TUIASI Restaurant)

13:30 – 15:00 Doctor Honoris Causa Ceremony
(Conference Room of TUIASI)

15:30 – 16:45 Sections Session

16:45 – 17:00 Coffee Break

17:00 – 18:00 Sections Session

19:00 Conference Gala Dinner (Moldova hotel)

Friday, June 7th, 2024

09:00 – 09:30 Conference Closing Ceremony (M3 Room,
Mechanical Engineering Faculty)

09:30 – 11:30 Visit in laboratories, Mechanical Engineering Faculty

12:00 – 13:00 Lunch Break (TUIASI Restaurant)

NOTE: All times are Eastern European Summer Time (EEST)

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Session ACME-01: Machine Design. Tribology

Thursday, June 6th, 2024

Chairpersons: *Prof. Gelu IANUS* and *Prof. Viorel PALEU*

No.	ACME code	Title of the papers and authors	Hours
1	0011	STUDY ON THE UTILIZATION OF ENVIRONMENTALLY SUSTAINABLE MATERIALS IN GEARS MANUFACTURING Robert Ciobanu, Ciprian Rizescu, Corina Cobzac, Dana Rizescu, Titi Pascu	15.30 - 15.45
2	0014	INFLUENCE OF RUBBER DEPOSITS ON TYRE - ROAD FRICTION Ionuț Marius Nazarie, Ilie Muscă	15.45 - 16.00
3	0021	KINETIC FRICTION COEFFICIENT IN STICK-SLIP LINEAR MOTION Cezara-Măriuca Oprișan, Teodor Gavril, Ana Tufescu, Dumitru N.Olaru	16.00 - 16.15
4	0027	Exploring the Environmental Implications of Static and Kinetic Friction Coefficients: A Study on the Contact Between Glass and Soft Materials Bogdan Chiriac, Ana Tufescu, Dumitru N. Olaru	16.15 - 16.30
5	0029	Finite Element Analysis of Stress Distribution and Displacement in the Human Knee Joint: Enhancing Osteoarthritis Diagnosis Denisa Șmadici, Ana Tufescu, Viorel Paleu	16.30 - 16.45
		Cofee Break	16.45 - 17.00
6	0031	A NEW MODEL TO ESTIMATE FRICTION TORQUE IN MINIATURE BALL BEARING Gelu Ianuș, Denis Cojocaru, Vlad Cârlescu and Dumitru N. Olaru	17.00 - 17.15
7	0034	Theoretical performance of exhaust valves in high-pressure pumps under maximum flow rates Constantin-Razvan Iordache, Carmen Bujoreanu and Narcis-Daniel Petrea	17.15 - 17.30
8	0024	SUSTAINABLE SOLUTIONS FOR FRICTION ASSESSMENT EQUIPMENT USING AXIOMATIC DESIGN PRINCIPLES Adelina Hrițuc, Andrei Marius Mihalache, Marius-Ionuț Rîpanu, Oana Dodun, Gheorghe Nagîț, Elisaveta Crăciun, Laurențiu Slătineanu	17.30 - 17.45

Session ACME-02: Materials and Surface Engineering. Mechanics of Deformable Bodies. Technologies in Agriculture and Food Processing

Thursday, June 6th, 2024

Chairpersons: *Prof. Corneliu MUNTEANU* and *Prof. Viorel GOANTA*

No.	ACME code	Title of the papers and authors	Hours
1	0001	EXPERIMENTAL MEASUREMENTS OF WIND-INDUCED LOADS ON A MODEL-SCALE BUILDING Radu Alexandru Mocanu, Radu Bosoanca, Dan Constantin Obreja, Costel Iulian Mocanu, Oana Marcu	15.30 - 15.45
2	0022	SURFACE ROUGHNESS ANALYSIS USING SAMPLE ENTROPY IN MILLING ALUMINUM ALLOY Emil Nicusor Patru, Dumitru Panduru, Marin Bica, Nicolae Craciunoiu, Dan Marghitu	15.45 - 16.00
3	0019	RESEACHES ON THE TEMPERATURE IN TURNING PROCESS OF Ti6Al4V TITANIUM ALLOY Dumitru Panduru, Emil Nicusor Patru, Marin Bica, Nicolae Craciunoiu	16.00 - 16.15
4	0026	ABRASION RESISTANCE OF A DAMASCUS STEEL MANUFACTURED BY REUSE OF SOME MATERIALS Ioan Surugiu, Margareta Coteață, Ștefan Jureschi, Roxana Hobjâlă, Elisaveta Crăciun, Laurențiu Slătineanu	16.15 - 16.30
5	0032	Structural and chemical analysis of fracture through tension and torsion of 316L stainless steel Gabriela Huțanu, Liviu Andrușcă, Mihai Popa, Petronela Paraschiv, Vasile Manole, Ioan Știrbu, Nicanor Cimpoescu	16.30 - 16.45
Cofee Break			16.45 - 17.00
6	0030	THE CORRECT EVALUATION OF INTERNAL STRESS FIELD IN TWO-DIMENSIONAL CONTACTS IN CASE OF A UNIFORM PRESSURE DISTRIBUTION – MATHEMATICAL CONSIDERATIONS Gabriel Popescu, Andrei Popescu	17.00 - 17.15
7	0039	SHAKEDOWN IN ROLLER BEARINGS: INFLUENCE OF MATERIAL BEHAVIOUR AND BEARING STEEL STRUCTURE Gabriel Popescu, Andrei Popescu	17.15 - 17.30
8	0048	Mechanical behavior of recycled PLA versus rPLA 3D printed parts Mihai Axinte, Daniela-Lucia Chicet, Romeu Chelariu, Radu Ioachim Comănesci, Gheorghe Bădărău	17.30 - 17.45

9	0050	THERMAL COATING OF PLA - 3D PRINTED PARTS Mădălin Farcaș, Daniela Lucia Chicet, Mihai Axinte, Bogdan Istrate, Ștefan Adrian, Corneliu Munteanu	17.45 - 18.00
10	0049	The influence of fatigue stresses upon the aspect of the specific stress-strain curve Stelian Cazan, Viorel Goanță, Layth Alkisswani, Igor Blanari, Liviu Andrușcă	18.00 - 18.15
11	0052	IMPACT OF LOCAL PLASTIC DEFORMATION ON FATIGUE LIFE AND STRENGTH OF 2024-T3 ALUMINUM ALLOY NOTCHED SPECIMENS Igor Blanari, Stelian Cazan, Fayez Samara, Viorel Goanță	18.15 - 18.30

Session ACME-03: Mechatronics. CAD. Mechanical Vibrations

Thursday, June 6th, 2024

Chairpersons: *Prof. Marcelin BENCHEA* and *Prof. Carmen BUJOREANU*

No.	ACME code	Title of the papers and authors	Hours
1	0038	IMPACT OF MEDICAL MECHATRONIC SYSTEMS ON REDUCING NOSOCOMIAL INFECTIONS Malina Foisor, Mihai Avram	15.30 - 15.45
2	0023	Additive manufacturing – an environmentally sustainable method for producing gears: theoretical and experimental considerations Ionela-Mihaela Baci, Alexandra-Gabriela Vasilescu, Mihai Avram, Bogdan Grănescu, Victor Constantin, Daniel Besnea, Edgar Moraru	15.45 - 16.00
3	0042	Portable system for processing sEMG signals with neural network models for measuring hand grip force Corina-Ioana Cobzac, Mihai Avram	16.00 - 16.15
4	0028	NUMERICAL ANALYSIS OF VEHICLE LOADS USING MATLAB Velniciuc Adi-Mihăiță, Bujoreanu Carmen and Boacă Gheorghită	16.15 - 16.30
5	0035	ACOUSTIC PROPERTIES EVALUATION OF SOUND ABSORBING PANELS PROTOTYPES Elena Adelina Chiriac, Carmen Bujoreanu, Marcelin Benchea	16.30 - 16.45
		Cofee Break	16.45 - 17.00

Session ACME-04: Theory of Mechanisms and Machinery. Robotics

Thursday, June 6th, 2024

Chairpersons: *Prof. Erwin-Christian LOVASZ* and *Prof. Florentin BUIUM*

No.	ACME code	Title of the papers and authors	Hours
1	0036	OPTIMAL SYNTHESIS OF THE FIVE-BAR LINKAGES WITH 2 SYMMETRICAL STRUCTURE BY USING IMPOSED TRAJECTORIES 3 FOR HOME TRAINING Tivadar Demjen, Alexandru Oarcea, Elida-Gabriela Tulcan, Erwin-Christian Lovasz, Dan Cristian Silaghi-Perju	15.30 - 15.45
2	0040	UNITARY KINEMATIC ANALYSIS AND SYNTHESIS 2 OF THE SYMMETRICAL SEVEN-BAR LINKAGES 3 FOR THE DESIGN OF A MEDICAL DISINFECTION ROBOT Elida-Gabriela Tulcan, Carmen Sticlaru, Alexandru Oarcea, Erwin-Christian Lovasz	15.45 - 16.00
3	0044	ECOLOGICAL DESIGN PRINCIPLES FOR A VIBRATING CONVEYOR Ionut-Cristian Romanu, Stelian Alaci, Luminita Irimescu, Delia-Aurora Cerlinca, Costica Lupascu and Ioan Doroftei	16.00 - 16.15
4	0045	Forces transmission quality of complex mechanisms using the structural groups procedure Florentin Buium, Cezar D. Duca and Ioan Doroftei	16.15 - 16.30
5	0046	A REVIEW ON INTERFACING STRATEGIES USED FOR ROBOTIC UPPER LIMB PROSTHESES Radu-Octavian Sandu, Danut-Constantin Irimia and Ioan Doroftei	16.30 - 16.45
		Cofee Break	16.45 - 17.00
6	0051	A COMPREHENSIVE REVIEW OF LOWER LIMB EXOSKELETONS Cristina-Magda Cazacu, Vitalie Coadă, Ioan Doroftei, Stelian Alaci	17.00 - 17.15
7	0047	Designing an Agricultural Mobile Robot with Hybrid Locomotion Ioan Doroftei, Stelian Alaci, Marius–Gheorghe Hagan, Andrei Vieru	17.15 - 17.30

Session ACME-06: Automotives. Engine and Transmission. Road Safety

Thursday, June 6th, 2024

Chairpersons: *Prof. Lidia GAIGINSCHI* and *Prof. Edward RAKOSI*

No.	ACME code	Title of the papers and authors	Hours
1	0002	INVESTIGATIONS ON PERFORMANCE AND EMISSIONS OF A DIESEL ENGINE EQUIPPED WITH A HHO INSTALLATION ON A ROLLER CHASIS Gheorghe Dan, Bica Marin, Tutunea Dragos	15.30 - 15.45
2	0004	THE EXPERIMENTAL RESULTS OF THE COMBUSTION OF AIR HYDROGEN MIXTURE IN DIESEL ENGINE Alexandru Cernat, Niculae Negurescu, Constantin Pana, Cristian Nutu, Rares Georgescu	15.45 - 16.00
3	0005	EXPERIMENTAL DETERMINATIONS IN ORDER TO ESTABLISH THE INFLUENCE OF THE DIESEL QUALITY AND ENGINE LOAD ON THE SMOKE EMISSIONS OF DIESEL CARS Salvadore Mugurel Burciu	16.00 - 16.15
4	0006	EXPERIMENTAL STUDY OF COMBUSTION AT HYDROGEN FUELLED ENGINE Rares Georgescu, Constantin Pana, Niculae Negurescu, Alexandru Cernat, Cristian Nutu, Andreea Panait	16.15 - 16.30
5	0008	OPTIMIZING ROAD TRAFFIC IN THE VEHICLE ACCESS AREA WITH A HIGH DEGREE OF ACCIDENTS IN THE MUNICIPALITY OF VULCAN Aurelian Nicola, Razvan Bogdan Itu, Bogdan Ioan Marc	16.30 - 16.45
		Cofee Break	16.45 - 17.00
6	0009	THEORETICAL FUNCTIONAL MODELING OF A SECONDARY ENERGY SYSTEM INTEGRATED INTO AN ELECTRIC VEHICLE Cezar Ciobotar, Edward Rakosi, Tudor-Marian Ulian, Gheorghe Manolache	17.00 - 17.15
7	0025	STUDY OF THE IMPACT OF AIR INTAKE TEMPERATURE SENSOR ON TURBOCHARGED PETROL ENGINES AIR-FUEL RATIO Andrei-Ionut Dontu, Mihail Tintila, George Achitei, Tudor-Marian Ulian	17.15 - 17.30

Session ACME-07: Applied Thermodynamics, Heat Transfer, and Renewable Energy. Thermal Systems

Thursday, June 6th, 2024

Chairpersons: *Prof. Aristotel POPESCU* and *Prof. Dan-Teodor BALANESCU*

No.	ACME code	Title of the papers and authors	Hours
1	0003	INVESTIGATION OF ENGINE PERFORMANCE OF WALNUT OIL METHYL ESTERS (RME) AS AN ALTERNATIVE FUEL Dragos Tutunea	15.30 - 15.45
2	0007	IDENTIFYING HEAT LOSSES IN BUILDINGS - PROPOSED SOLUTIONS TO INCREASE ENERGY EFFICIENCY Eugenia Trașcă, Gabriel-Cosmin Buzatu, Marin Bică	15.45 - 16.00
3	0010	PERFORMANCE AND ENVIRONMENTAL IMPACT ANALYSIS OF A GAS-STEAM COMBINED CYCLE POWER PLANT WITH BOTTOMING ORC UNIT Dan-Teodor Bălănescu, Vlad-Mario Homutescu, Marius-Vasile Atanasiu	16.00 - 16.15
4	0013	HYDROGEN BLENDING WITH OXY-COMBUSTION: COMBUSTION CHARACTERISTICS Lidia Gaiginschi, Gheorghe Dumitrașcu, Bogdan Horbaniuc, Tudor Iavnic	16.15 - 16.30
5	0033	Prospects of convective heat transfer enhancement using non-uniform thermal conductivity demonstrated in laminar flow past horizontal plates Gabriel-Dumitru Tcaciuc, Aristotel Popescu, Carmen-Ema Panaite, Ana-Georgiana Lupu	16.30 - 16.45
		Cofee Break	16.45 - 17.00

ACME Poster Session

Thursday, 6 June, 2024

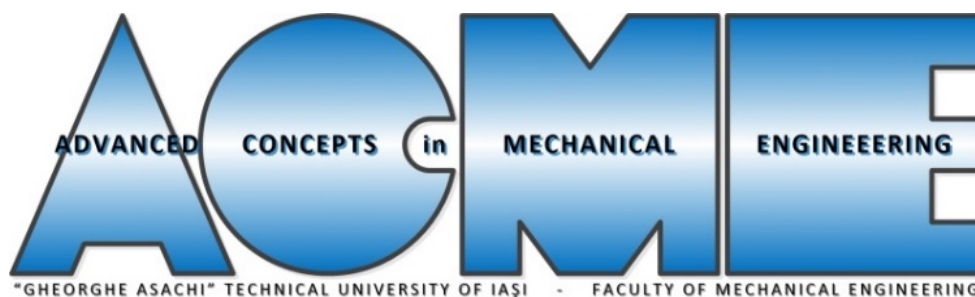
ACME code	Title of the papers and authors	Hours	Room
0017	DYNAMIC ANALYSIS OF THE VEHICLE WHEEL GUIDANCE SYSTEM USING VIRTUAL PROTOTYPING TOOLS Cătălin Alexandru	15.30 - 18.00	IMMR Dept. 1 st floor
0018	DAYLIGHT FACTOR MAXIMIZATION FOR INDOOR COMFORT IN 2 TEMPERATE CONTINENTAL CLIMATE 3 ANALYTICAL COMPARISON BETWEEN 2 OFFICE BUILDINGS Răzvan-Nicolae Ivanciu, Aurora-Irina Dumitrașcu, Călin-Gabriel Corduban		
0020	IMPACT OF ADDITIVE MANUFACTURING IMPLEMENTATION IN GASTRONOMY: DEMONSTRATIVE MODELS USING CHOCOLATE 3D PRINTERS Daniel Besnea, Victor Constantin, Edgar Moraru, Delia-Alexandra Prisecaru, Alina Rodica Spânu, Iolanda Panait, Vlad-Andrei Stănescu		
0041	INVESTIGATING MECHANICAL PROPERTIES OF ADDITIVELY MANUFACTURED BIODEGRADABLE PLA MATERIAL Marcelin Benchea, Liviu Andrușcă, Toma Chiruță		
0053	Microhardness evaluation and differential scanning calorimetry analysis on recycled, crushed and heat-treated glass (RCTG) Epure Cristian, Munteanu Corneliu, Istrate Bogdan, Lohan Nicoleta Monica, Cimpoesu Nicanor		

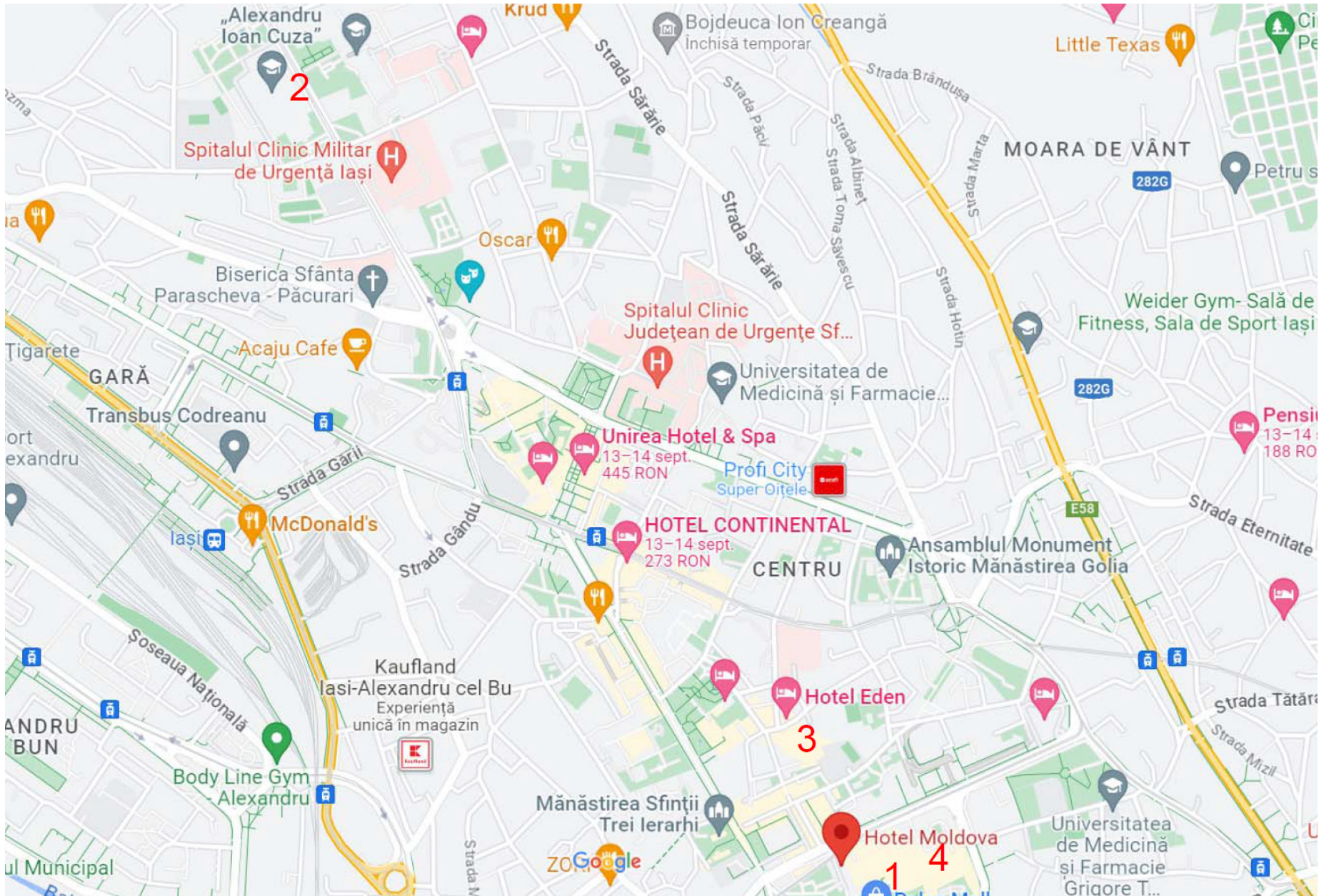
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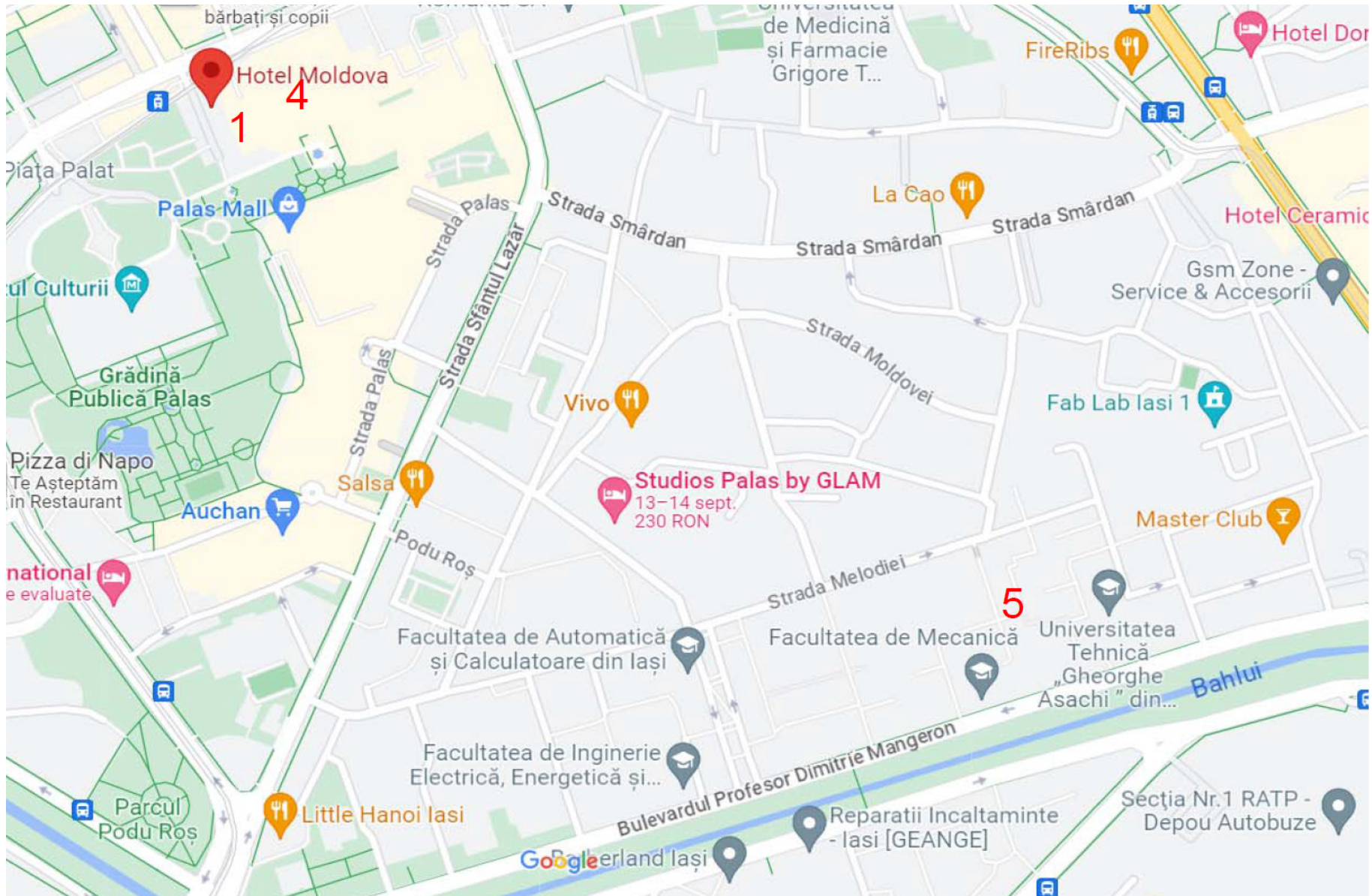
TOPICS:

- Section 1 Machine Design. Tribology
- Section 2 Materials and Surface Engineering
- Section 3 Mechatronics. CAD. Mechanical Vibrations
- Section 4 Theory of Mechanisms and Machinery. Robotics
- Section 5 Mechanics of Deformable Bodies
- Section 6 Automotives. Engine and Transmission. Road Safety
- Section 7 Applied Thermodynamics, Heat Transfer, and Renewable Energy. Thermal Systems
- Section 8 Technologies in Agriculture and Food Processing





1 – Moldova Hotel; 2 – TUIASI Aula; 3 – Eden Restaurant; 4 – Ramada Hotel



1 – Moldova Hotel; 4 – Ramada Hotel; 5 - IMMR Department