

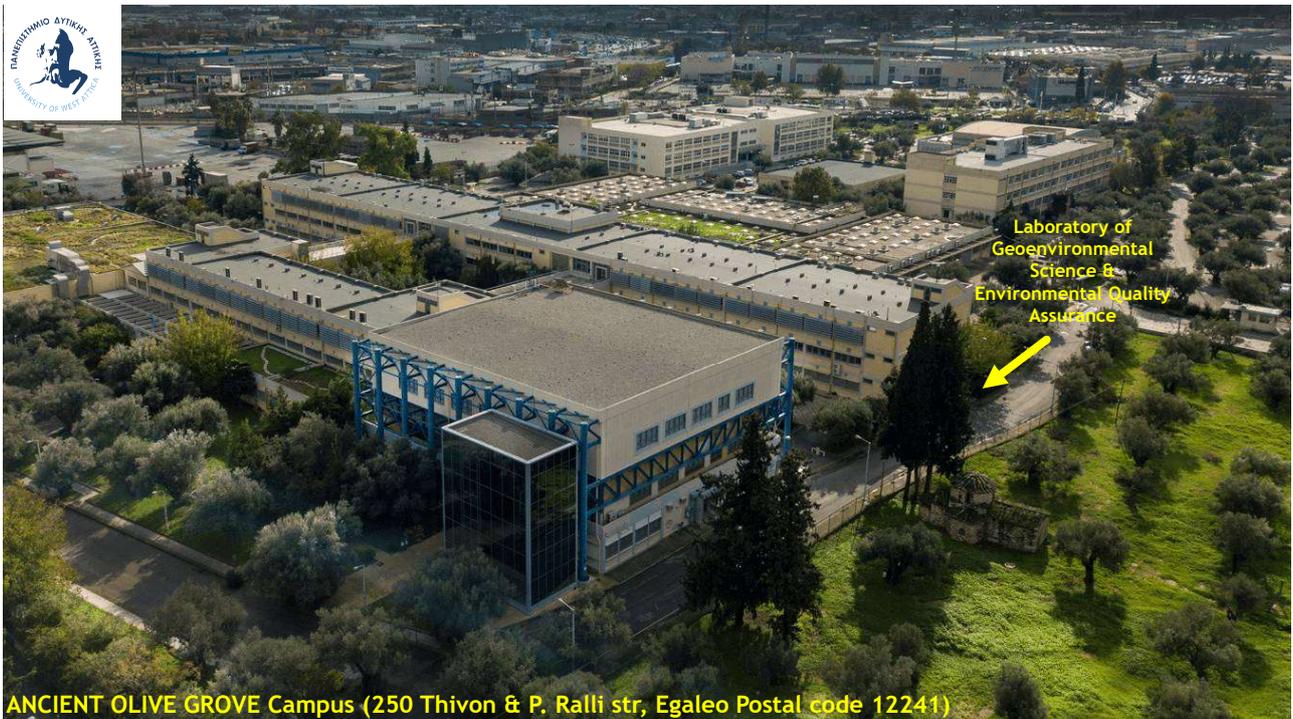


UNIVERSITY OF WEST ATTICA
SCHOOL OF ENGINEERING - DEPARTMENT OF CIVIL ENGINEERING
LaboratoRy of GEoenvironmental Science & Environmental Quality
Assurance-LA.R.GE.

<http://www.civ.uniwa.gr/en/research/research-labs/>



Egaleo, 2022



ANCIENT OLIVE GROVE Campus (250 Thivon & P. Ralli str, Egaleo Postal code 12241)

Location

- ▶ The **Laboratory of Geoenvironmental Science and Environmental Quality Assurance** belongs to the Department of Civil Engineering of the **University of West Attica**.
- ▶ The Laboratory is located on the Ground floor of the B Building (B010) at the **ANCIENT OLIVE GROVE Campus** (250 Thivon & P. Ralli str, Egaleo Postal code 12241, Athens +302105381256)

Website: <http://www.civ.uniwa.gr/en/research/research-labs/>



Director



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Main objectives of the Laboratory

- **Development of educational & research activities in the scientific fields of:**
 - ▶ geoenvironmental science
 - ▶ environmental quality assurance
 - ▶ water quality assessment
 - ▶ soil/sediment quality assessment
 - ▶ contamination assessment
 - ▶ remediation of contaminated land
 - ▶ water resources development
 - ▶ environmental protection
 - ▶ health risk assessment
 - ▶ ecological risk assessment

Water Resources Development

- ✓ characterization of water bodies status
- ✓ formulation of programme of measures
- ✓ multicriteria evaluation of measures and projects
- ✓ formulation of water resources managements plans
- ✓ implementation strategies of WFD

Water Quality Assessment for drinking and irrigation uses

- ✓ water sampling and preparation
- ✓ determination of water quality parameters
- ✓ water quality monitoring
- ✓ statistical analysis
- ✓ hydrogeochemical analysis
- ✓ spatial distribution of water quality parameters
- ✓ study of water-sediment-soil interaction processes
- ✓ discrimination of natural and anthropogenic factors affecting water quality

Soil/Sediment Quality Assessment

- ✓ evaluation of soil/sediment properties
- ✓ soil/sediment sampling, sampling of suspended matter
- ✓ grain size analysis
- ✓ measurements of hydraulic conductivity
- ✓ development of moisture retention curves
- ✓ determination of spatial distribution of soil/sediment element contents
- ✓ measurement of soil/sediment pH/conductivity/lime requirement
- ✓ analysis of major and trace elements of soil samples



Hydrological Research of Surface & Groundwater Bodies

- ✓ flow measurements
- ✓ water level measurements
- ✓ model development and evaluation
- ✓ groundwater modelling

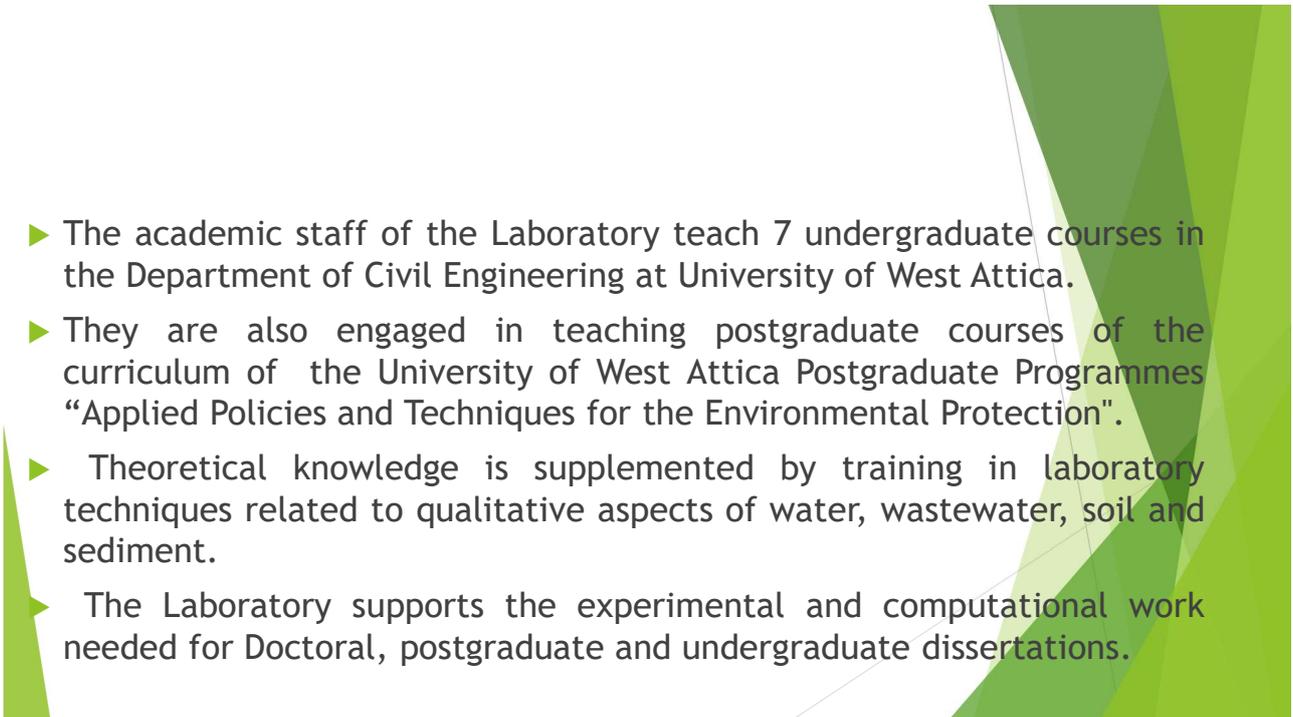
Laboratory Equipment

- ▶ Dionnex ICS 6000 Ion Chromatography
- ▶ Agilent Cary 3500 Spectrophotometer UV-Vis for determination of all key parameters from Ammonium to Zinc - for water and extracted liquid solutions
- ▶ Shimadzu Total Organic Carbon analyzer
- ▶ GPS - Spectra Precision Geographical Positioning (Ashtech Satellite System Receiver
- ▶ Various systems and devices
 - Double-distilled water purification system
 - Water distillation system
 - Vacuum filtration system
 - Analytical balances
 - OS-7200 orbital mechanical shaker
 - Megafuge 16 TX-400 SLIDE COAT





Education

- 
- ▶ The academic staff of the Laboratory teach 7 undergraduate courses in the Department of Civil Engineering at University of West Attica.
 - ▶ They are also engaged in teaching postgraduate courses of the curriculum of the University of West Attica Postgraduate Programmes “Applied Policies and Techniques for the Environmental Protection”.
 - ▶ Theoretical knowledge is supplemented by training in laboratory techniques related to qualitative aspects of water, wastewater, soil and sediment.
 - ▶ The Laboratory supports the experimental and computational work needed for Doctoral, postgraduate and undergraduate dissertations.

Research



- ▶ LARGE is engaged in basic and applied research and provides expertise in the field of geoenvironmental science and environmental quality assurance.
- ▶ LARGE successfully combines experimental work and theoretical analysis often by means of laboratory and mathematical simulations.
- ▶ Research projects requiring a broader field of expertise are usually conducted in cooperation with the other laboratories of the School of Engineering.
- ▶ In addition to research funded directly by University of West Attica, the major part of LARGE research is sponsored by public and private organisations in Greece.

Current Research Projects



- ▶ The aim of the cluster is to strengthen the cooperation between companies for the systems development that will create value in the waste chain, on the one hand through the reduction of their management and processing costs and on the other hand through the application of circular economy practices
- ▶ https://cirowa.eu/?page_id=2364&lang=en

REFRACT

- ▶ Recycling of used refractories from various industries to produce Alumino-silicate refractories ceramics and masses
- ▶ <http://refract.uniwa.gr/>

Dissemination of Research Activities and Financial Management

- ▶ The results of the research activities are disseminated in the form of PhD, MSc and Diploma theses, project reports and scientific papers published in scientific journals or proceedings of conferences.
- ▶ The financial management of all research projects is conducted by the Research Committee of University of West Attica

Consultancy

- ▶ Parallel to the educational and research activities, Laboratory of Geoenvironmental Science and Environmental Quality Assurance offers consulting services to public organisations and private companies.
- ▶ The consulting services include:
 - conventional and specialised water, soil/sediment analyses
 - on site measurements
 - remediation of contaminated sites
 - environmental monitoring
 - environmental impact assessment
 - integrated water resources management studies

Indicative Analytical Work

- ▶ pH ,Turbidity, Dissolved oxygen, Alkalinity, Hardness, Salinity, Conductivity, SAR
- ▶ Ca^{2+} , Mg^{2+} , K^+ , Na^+ , Li^+ , SO_4^{2-} , NO_3^- , NO_2^- , NH_4^+ , PO_4^{3-} , Br^- , Cl^-
- ▶ Trace elements
- ▶ Total and Suspended Solids
- ▶ TOC



Suburban areas in flames: Dispersion of potentially toxic elements from burned vegetation and buildings. Estimation of the associated ecological and human health risk

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Wildfire effects on soil quality: application on a suburban area of West Attica (Greece)

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Article

Linking DPSIR Model and Water Quality Indices to Achieve Sustainable Development Goals in Groundwater Resources

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Article

Meta-Evaluation of Water Quality Indices. Application into Groundwater Resources

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Abstract: Until now, there was no simple procedure to test the performance of water quality indices

Recent publications in peer-reviewed international journals



Article

The Effectiveness of Rainwater Harvesting Infrastructure in a Mediterranean Island

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ORIGINAL ARTICLE

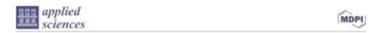
Forecasting discharge rate and chloride content of karstic spring water by applying the Levenberg–Marquardt algorithm

Georgios K. Bekas¹, Dimitrios E. Alexakis¹, Dimitra E. Gamvroula²

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Abstract The Mediterranean countries' coastal karstic aquifer systems are facing increased pressure due to seawater intrusion and drought impacts. There is a need to understand better karstic systems' functional mechanisms for developing the most appropriate management scenarios of water resources in these systems. In this study, the application of Non-Linear Autoregressive



Article

Waste Classification of Spent Refractory Materials to Achieve Sustainable Development Goals Exploiting Multiple Criteria Decision Aiding Approach

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Introducing stacking machine learning approaches for the prediction of rock deformation

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land

Article

Multielement Contamination of Land in the Margin of Highways

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Abstract: The spatial

in the West Attica re-

contaminated sites is

shown in the figure.

The figure shows a map of the West Attica region, highlighting the Saronic Gulf and the location of the study area. It includes labels for 'Greece mountain', 'Kantara', 'Saronic Gulf', and 'Saronic Gulf'. There are also icons for a car, a truck, and a person, indicating the presence of highways and human activity. The map shows the spatial distribution of contamination sites along the highways.

Journal articles published in 2022 (10)

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- Spyridakos, A.; Alexakis, D.E.; Vryzidis, I.; Tzotsolas, N.; Varelidis, G.; Kagiaras, E. Waste Classification of Spent Refractory Materials to Achieve Sustainable Development Goals Exploiting Multiple Criteria Decision Aiding Approach. *Appl. Sci.* 2022, 12, 3016. <https://doi.org/10.3390/app12063016>
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