Title: AMBICON Lab

AMBICON Lab as a part of Faculty of Natural and Technical science within Goce Delcev University in Stip in deferent forms exists for more than a two decades, strongly focused on development of methodological base for ambient air monitoring and environmental analyses. In current format, AMBICON unites three scientific groups including ambient control and sampling group, electrons scanning microscopy and elemental analysis groups.

Infrastructure / Equipment Overview Table

	Details
Partner	Goce Delcev University
Equipment type	Laboratory equipment for ambient monitoring and analysis
Target Group	Governmental institutions, industry companies and researchers
Key Technology	Laboratory equipment for ambient monitoring and analysis
Status	Available to use
Requirements for Participation	Relevant project or need, basic technical knowledge

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Description of Available Infrastructure and Equipment

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Since 2014 the lab is accredited in accordance with ISO 17025 for environment and samples from the environment testing areas, including but not limited to:

- Standard gravimetric measurement method for the determination of the PM10/PM2,5 mass concentration of suspended particulate matter;
- Determination of chemical composition of ambient particulate matter using Energy Dispersive X-Ray Fluorescence (EDXRF);
- Direct on filter analyses of ambient air particulates mineralogy by X-ray diffractometer;
- Particulate geometry/morphology and composition using Electron Scanning Microscopy equipped energy dispersive spectrometer (EDS);
- Dual wavelength transmissometer for determination of Black Carbon and Aromatic Organic Compounds in ambient particulates.

- Personal exposure or background workplace concentration of different airborne chemical species using direct reding instrumentation (electrochemical, PID, infrared sensor) or dosimetry tubes.
- Thermal comfort and ventilation surveys
- Noise and vibration measurements, including personal noise exposure (noise dosimetry)
- Modeling and assessment of data including but not limited to dispersion and receptor models, noise control measures modeling and statistical analysis.

https://iarm.gov.mk/en/2021/07/01/lt-052-university-goce-delcev-shtip/

Recently, new five-year extension of accreditation was granted with additional analytic capabilities and improved precision for all methods within testing area. Focus on improvement and innovation provide strong methodology standpoint for indicating possible sources through aerosols characteristics determination, as much as a using data as input for source apportionment studies.

As a result of permanent development and high-quality services, the lab has built a long-term collaboration with largest industrial and servicing companies based in Macedonia, Serbia, Bulgaria, Kosovo and Albania, thus building a large scientific and research database (over 2000 individual analysis).

In addition, AMBICON operates independent monitoring network with in house developed ambient particulate monitors, all in close non-commercial collaboration with MOEPP and local communities to increase scientific database and support monitoring efforts in areas with no coverage or specific air quality problems. Data are in real time shared for public information using lab portal and popular air quality applications.

Part of the services and methods implemented are summarized in the table below:

Description	Reference	Status
Ambient air - Standard gravimetric measurement method for the determination of the PM10 or PM2,5 mass concentration of suspended particulate matter	EN 12341:2014	Accredited
Standard operating procedures (SOPs) for sampling and analysis Determination of metal in ambient particulate matter using Energy Dispersive X-Ray Fluorescence (EDXRF) Chapter VII, A Model Sop For Elemental Analysis Of Air Particulate By Energy Dispersive X-Ray Fluorescence (EDXRF)	EPA/625/R-96/010a, Method IO-3:3:1999	Accredited
Direct-on-filter analyses by X-ray diffractometer Determination of crystalline silica in respirable airborne dust using X-ray diffractometer	HSE, MDHS101/2:2014	Accredited
Methods for the Determination of Hazardous Substances Health and Safety Laboratory; General methods for sampling and gravimetric analysis of respirable and inhalable dust A2 – PERSONAL SAMPLING HEADS And Accessories For Monitoring Dust, Aerosols And Vapours Users Guide, HB 3175-06 Determination of dust/ particulate matter exposure (inhalable, thoracic and respirable) in occupational and living environment - gravimetric method	HSE, MDHS 14/3	Accredited
Acoustics – Determination of occupational noise exposure – Engineering method	EN ISO 9612:2010	Accredited

Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels	ISO 1996-2:2010	Accredited
Indoor air – Part 7: Sampling strategy for determination of airborne fiber concentrations.	EN 16000-7:2009	Accredited
Ambient air -- determination of numerical concentration of inorganic fibrous particles -- Scanning Electron Microscopy Method	ISO 14966:2002	Accredited
Determination of personal exposure to gaseous substances (electrochemical, PID, infrared sensors or dosimetric tubes)	In House	Implemented
Thermal comfort	ISO 7730:2006	Implemented
Light (Outdoor and Indoor Industrial)		Implemented
Human vibration for arm and whole-body measurements.	ISO 2631-1	Implemented

In addition a full range of wet chemistry including environmental testing of water, soil and sediments using ICP-MS is available through a cooperation of other University labs (ISO 17025 accredited).


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