



**THE PURCHASED EQUIPMENT AND ITS USE**  
**AT THE NATIONAL UNIVERSITY OF MONGOLIA UNDER THE URGENT PROJECT**  
**PARTNER 5**




**Introduction:**

At the beginning of the URGENT project, the end-user surveys were conducted and the result of the survey helped us not only identify gaps in the existing curriculum and develop the list of courses to be revised or developed by NUM but also identified the equipment that needs to be purchased by the project that would support to strengthen the study laboratory to our students' current needs.




**Procurement process:**

In the first year of the project, the list of equipment and its technical specifications were approved by the project coordinator on 1<sup>st</sup> August 2021 and by the NUM-P5 on 10<sup>th</sup> August 2021. According to the Grant rule and under the project coordinator's guidance, possibly 8 suppliers were identified and sent an e-mail with the technical specification to request a price offer on 7 September 2021.

Table 5: List of the purchased equipment

№	Equipment	Technical specification	Quantity	Photo
1.	Drone DJI Mavic 2 pro	~ Shutter Speed: Electronic Shutter: 8–1/8000s ~ Still Image Size: 5472×3648 ~ Still Photography Modes: ~ Single shot ~ Burst shooting: 3/5 frames ~ AEB: 3/5 bracketed frames at 0.7 EV Bias ~ Video Resolution: ~ 4K: 3840×2160 24/25/30p ~ 2.7K: 2688×1512 24/25/30/48/50/60p ~ FHD: 1920×1080 24/25/30/48/50/60/120p ~ Max Video Bitrate: 100Mbps ~ Photo Format: JPEG / DNG (RAW)	1	
2.	Water Level Meter Model 101	~ For measuring the depth of water in wells, boreholes, standpipes, and tanks, Model 101 Water Level Meters are the industry standard for portable hand-operated meters. The Solinst 101 Water Level Meter with P7 Probe features an extremely durable, laser-marked PVDF flat tape, with an enhanced dog bone design that is thicker, reducing adherence to the side of the well casing. ~ Durable PVDF non-stretch tape ~ Improved electrical properties ~ Thicker dog bone design prevents clinging to the sides of the well ~ Permanently laser marked every 1/100 ft or each mm	1	
3.	Multiple Water Quality Meter	~ Measuring Item: pH (0.0~14.0), ORP (-2.000~2.000 mV), DO (0.0~20.0 mg/l), EC (0.0~10.0 s/m), Salinity (0.0~4.0%), Temperature (-5.0~55.0 °C), Turbidity (0.0~800.0 NTU) ~ Output: RS232C, Printer/Analog/Open collector output ~ Memory: Data for 36 days for all items with 15-minute interval ~ Power Supply: Instrument: AA size alkaline battery×2 ~ Sensor module: AA size alkaline battery×3 ~ Dimension: W75×H187.5×D37.5mm ~ Accessory: Standard sensor with 2 m cable, Standard liquid, Soft case, etc.	1	



4.	Discrete Interval Sampler	<p>~ The Model 425 Discrete Interval Sampler provides a no-purge sampling option for collecting groundwater samples from discrete levels, and points of inflow, in wells and boreholes. It can also be used for profiling open water bodies, and for sampling above and below oil/product layers, as well as the actual product (e.g. LNAPL and DNAPL).</p> <p>~ The pump is used to apply pressure and seal the Discrete Interval Sampler before it is lowered. This prevents water from filling the sampler until it reaches the chosen depth. Once the sampler reaches depth, the pressure is vented and hydrostatic pressure fills the sampler. Before retrieval, the sampler is repressurized to ensure there is no mixing of water from different levels on the way up.</p> <p>~ High-pressure hand pump 89</p> <p>~ Model 425 Discrete Interval Sampler, 1.66" x 2 ft 327</p> <p>~ Single line natural LDPE tubing, 0.17" ID x 0.25" OD, 500 ft. Roll 90</p>	1	
5.	Sound level meter	<p>~ Measurement range: 20-140dB RMS (143.3dB peak)</p> <p>~ Total Noise floor: 19dB(A) Class 1, 25dB(A) Class 2</p> <p>~ Time weightings: Fast, Slow, and Impulse simultaneously</p> <p>~ Frequency weightings: A, C, and Z (un-weighted) simultaneously</p> <p>~ Timers: Duration 1s-24h</p> <p>~ Batteries: 3x AA Alkaline, 10-12 hours with backlight off</p> <p>~ Weight: 270g without batteries</p> <p>~ Size (bcWxH): 230x72x31mm inc preamp and microphone</p> <p>~ Memory: 2GB (&gt; 1-year logging when set to 1-second interval, 999 runs).</p>	1	
6.	Air quality meter	<p>~ SO2 - 0-10 ppm,</p> <p>~ CO - 0-100 ppm,</p> <p>~ NO2 - 0-1 ppm,</p> <p>~ O3 - 0-0.5 ppm,</p> <p>~ PM10/PM2.5 - 0 – 1000 ug/m3,</p> <p>~ CO2 - 0-2000 ppm</p>	1	

Each piece of equipment has the following documents.

1. Quotation
2. Purchase order
3. Invoice
4. Bill, proving the amount of money has been transferred from NUM-P5 to the supplier
5. Bank statement by the supplier
6. Delivery note

**The study laboratory strengthening:**

EU-ERASMUS+, the Project, and the Partner's logos have been placed on all equipment.





Co-funded by the  
Erasmus+ Programme  
of the European Union



Figure 1: The labeled equipment

The study laboratory is located on the sixth floor of the NUM library building and is used for the educational process of bachelor, master, and doctoral programs.

Recently, the purchased equipment are used for winter and summer field studies of different classes such as Environmental management and Urban environment that developed under the URGENT project.



Figure 2: The equipment used for the winter study





Figure 2: The equipment used for the urban environment

Especially, around 150 bachelor students enroll the summer field study every year. During this period, students stay in a tent, and they learn different study tools such as water, air, and soil measurement.



Figure 2: Students' summer camp







Co-funded by the  
Erasmus+ Programme  
of the European Union



Figure 2: The equipment used during the summer field study

The number of beneficiaries is about 200 students (150 bachelor students/summer + 35 bachelor student/laboratory + 15 graduate students in an academic year).

### Shared outside of the university

The purchased equipment is used not only for degree study at the university but also it is shared with non-university people who need to use it. How to use video and text guides are prepared and uploaded on [the laboratory website](#).

How to use video guidelines:

1. Drone
2. Air quality meter
3. Multiple water quality meter
4. Discrete interval sampler

<https://youtu.be/KWfFNVUbfGg?si=82qS-Pgd5EbagvWg>

<https://youtu.be/XnYODPjIZxO?si=gof6Pb1HK6io-he>

<https://youtu.be/MuM11IN9m5A?si=8nc4W9GhhItaNIrI>

[https://youtu.be/iwu8EQZZ7rg?si=VdFwARM\\_2M4JM0IW](https://youtu.be/iwu8EQZZ7rg?si=VdFwARM_2M4JM0IW)

For example, air quality meter and sound level meter were used for urban environmental study by non-university organizations on 25 May 2024.

