



Co-funded by the  
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**Eesti Maaülikool**  
Estonian University of Life Sciences

## DRONES "Using drones in environmental research - basic knowledge and examples of applications"

**Tartu, Estonia 30.October-12. November, 2023**

Course of the EU Erasmus+ CBHE project "Urban Resilience and Adaptation for India and Mongolia: curricula, capacity, ICT and stakeholder collaboration to support green & blue infrastructure and nature-based solutions – URGEN.T" (619050-EPP-1-2020-1-DE-EPPKA2-CBHE-JP) that will take place at the Estonian University of Life Sciences (EMU).

### The concept and program overview

The aim of this course is give an overview about drones, flight regulations, flight planning and safety. Overview about drone based remote sensing and its applications are also included.

At the successful completion of the class, the student is aware of flight regulations related with drones and has knowledge about flight planning and about possible sources for input information. Also has overview about drone based remote sensing and its applications.

Main topics: History and basics of remote sensing; Estonian Land Board map data; ESTHub and Copernicus; Sentinel satellite missions; History and basics of drones; Flight safety and regulations; Flight planning; NOTAM; Drone based remote sensing (RGB, Multispectral, Thermal, LiDAR); Data processing; Applications. Test flights. Data collection. Analyzing collected data by Softwares.

### Drone course faculty:

Prof. **Kalev Sepp**, Estonian University of Life Sciences (Estonia)

Dr. **Anton Shkaruba**, Estonian University of Life Sciences (Estonia)

MSc **Anne Kull**, Estonian University of Life Sciences (Estonia)

MSc **Janar Raet**, Estonian University of Life Sciences (Estonia)

MSc **Kaupo Kokamägi**, Estonian University of Life Sciences (Estonia)

MSc **Raul Sampaio de Lima**, Estonian University of Life Sciences (Estonia)

MSc **Volha Kaskevich**, Estonian University of Life Sciences (Estonia)

**Pre-Course** 23-29 October 2023. Reading textbook

**In-School, October 30-November 12, 2023:**

**30. November, 2023, Kreutzwaldi 5-2C4**

**11.15 Lecture:** Introduction to remote sensing. UAV - the origin and development of the concept Raul Sampaio,

**13.15** GIS training Anne Kull

**31.10.23, Kreutzwaldi 5-2C4**

**10.15** Lectures: Examples of the applications of UAV. **Raul Sampaio,**

Regulations. Data collection. Data resolution. **Janar Raet, Raul Sampaio**

**13.15** Computer class. Introduction into Software's Kreutzwaldi 5-0A5, Lectures Anne Kull

**01.11.23. Kreutzwaldi 5-2C4**

10.15 Introduction to the University, course, faculty and participants. Prof. Kalev Sepp  
Lectures: Cameras and photogrammetry. Sensors Positioning. Terrestrial reference points and learning/training data. Compiling a flight plan. Flying. **Kaupo Kokamägi**

13.15 Drones. Preparing test flights

- Test flights

**02.11.23 Kreutzwaldi 5-2C4**

- 9.15 GIS training. Test flights

13. 15 PhD defending. Kreutzwaldi 5-2A1

Raul Sampaio de Lima "Novel approaches in multi-sensor unmanned aerial vehicles as basis for enhancing fire management frameworks". Opponent prof Tarmo Remmel (University of York, Canada),

**03.11.23. Kreutzwaldi 5-2A41**

**10.30** Professor Tarmo Remmel (York University, Canada) will give lecture "The complexities of measuring landscape structure".

Lectures: Radiometric calibration, Laser scanners **Kaupo Kokamägi**

**4-5. 11.23** Study trip and free time

**6.10.23**

- Overview of case studies;
- Collecting data on test sites

**7-9.11.23**

- Analyzing collected data in computer class, Lecturer Anne Kull

**11.11.23**

Reporting and graduation , Prof. Kalev Sepp