

Aerial surveying for 3-D surface modelling and detailed mapping

Presented by the department of Geography, Geo-Spatial Informatics and Meteorology, University of Pretoria

The short course in **Aerial surveying (UAV) for 3-D surface modelling and detailed mapping** aims to provide you with field-based demonstrations of aerial surveying using Unmanned Aerial Vehicle to acquire ultra-high resolution imagery of the study area, which will later (in the lab) be used to generate various geographic information products such as orthophoto, point clouds, digital elevation models (DEMs), digital surface models (DSMs) and detailed mapping from high spatial-resolution orthomosaic image. In particular, the detailed mapping of various land surface entities can be mapped accurately on the produced high-resolution image.

Drone technology also known as Unmanned Aerial Vehicles (UAVs) is the future for cost-effective and rapid data acquisition. Furthermore, UAVs can be used in high-risk situations and inaccessible areas in real-time. UAVs have been found to be a low-cost, alternative digital photogrammetry as opposed to the light detection and ranging (LiDAR) technique. This has revolutionised 3-D topographic surveys in most geological engineering and science work.

Course content

- **Day 1:** Introduction to UAV data processing; Understanding the flight plan; Understanding the placement of ground control points in the area of interest; departure to the site for flying and acquiring UAV data.
- **Day 2:** Step-by-Step processing of UAV-acquired data in Agisoft; Generation of geoinformation products such as orthophoto, point clouds, digital elevation models (DEMs) and digital surface models (DSMs).
- **Day 3:** Analysis of the generated geoinformation products, followed by group discussions on applications of processed outputs.

Learning outcomes

After successfully completing this course, you will

- Understand how to use a UAV to acquire data over an area of interest
- Know how to process raw UAV data in Agisoft in-order to produce geoinformation products
- Know how to analyse and interpret the generated geoinformation products for various applications

Who should enrol?

This course is ideal for professionals in the industry who have the appetite to acquire skill in UAV data processing to generate an assortment of high-resolution geoinformation products, this includes Surveyors, GIS technicians, GIS technologists or GIS professionals, Environmental practitioners.

Course fees

R8 500.00 per delegate (VAT incl.)

Course fees include all course material and refreshments during contact days.

Course fees must be paid in full 14 days prior to course start dates. Proof of payment can be submitted to enrolments@enterprises.up.ac.za.

Admission requirements

Prospective delegates should at least have the technical background in Land surveying and GIS.

Accreditation and certification

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Registration and enquiries

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Course Schedule

Time	Content and activities
Day 1: 28 October 2020	
08:15 – 08:30	Welcoming and course introduction (UAV Data processing)
08:30 – 09:00	Lecture 1: Introduction to Aerial surveying(UAV)
09:00 – 10:00	Lecture 2: Understanding the flight Plan
10:00 – 10:30	Tea
10:30 – 11:00	Lecture 3: Understanding GCPs placement in AOI
11:00 – 11:30	Practical 1: Departure to site: Execution of Aerial Survey(Flying)
13:30 – 14:30	Lunch
14:30 – 15:30	Discussion session
Day 2: 29 October 2020	
08:30 – 09:00	Lecture 4: Image processing
09:00 – 10:30	Practical 2: Processing in Agisoft (step by step) <ul style="list-style-type: none"> • Loading data • Coordinates system setting • Image alignment
10:30 – 11:00	Tea
11:00 – 12:30	Practical 2: Processing in Agisoft (step by step) <ul style="list-style-type: none"> • Read GCPs • Optimisation/ run mesh • Ortho-mosaicking
12:30 – 13:30	Lunch
13:30 – 15:30	Practical 2: Processing in Agisoft (step by step) <ul style="list-style-type: none"> • Point clouds • Point clouds classification • Surface modeling (DEM, DTM and DSM)
15:30 – 16:30	Practical 2: Processing in Agisoft (step by step) <ul style="list-style-type: none"> • Outputting • Orthophoto • Point clouds • Surface modeling
Day 3: 30 October 2020	
08:30 – 10:00	Lecture 5: Application of processed outputs <ul style="list-style-type: none"> • Point clouds • Surface models • Ortho-photo
10:00 – 10:30	Tea
10:30 – 12:00	Discussion groups
12:00 – 13:00	Lunch
	Questions and Answers

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