

CC310 - Drone/UAV Mapping and Image Processing Course

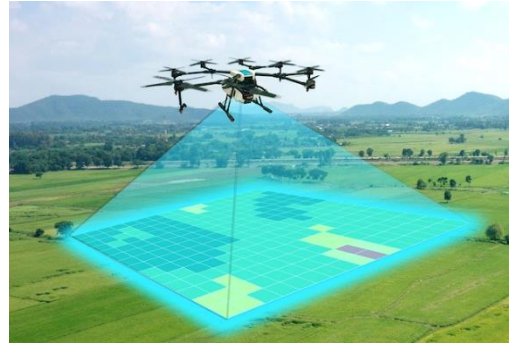
Course Duration: 10 Days

Training Fee: KSH 80,000 | USD 800

Course Registration: [Register Here>>](#)

1.0. Introduction

Drones are one of the great technological success stories of the 21st century! The demand for high quality aerial data capture from drones or UAVs is growing fast and now professional standard drones are readily available at affordable prices. Drones have made it possible to map an area very quickly in a very cost-effective manner, pushing those days back when just satellite imagery was an option. Industries like construction, agriculture, health-care, disaster support, mining, infrastructure inspection etc. are heavily using drones for aerial mapping and surveying. Drones enable acquisition of precise and high-resolution images (3-5cm!) or a 3D model of a project area with accurate measurements thus the end products makes the decision-making effective.



1.1. Course Overview

This detailed drone mapping course will focus on drone technology specifically on parts of a drone, drone sensors, drone data acquisition, data processing e.g. 3D models; overview of drone image processing e.g. Pix4D, Agisoft etc. The principle of drone mapping entails taking many images at different locations and altitude; and then using software to merge them together, creating a geometrically accurate map or model. In practice, this is accomplished using software that automates both flight and image capture. This course will give you the insights and knowledge to start performing drone-based mapping assignments. Orthomosaics, terrain maps, and 3D models (DSMs/DEMs) are the most common deliverables. Drone mapping also encompasses data captured with infrared and multispectral or hyperspectral cameras such as that of eBee SQ drone. By utilizing different sensors and capture methods, drones are able to provide useful data to a wide range of industries. This course will also focus of the use of drone field software (DroneDeploy, eMotion & DJI Go.) and image processing software (Pix4D, Agisoft...).

1.2. Course Content/Outline

- i. **Introduction to Drone Mapping:** History of drone mapping; Types of drones and drone camera sensors; Parts of a drone; An overview of aerial mapping.
- ii. **Types of Drone Camera Sensors:** Types of drones' cameras in the market; Effects of drone resolution on images; RGB and multi-spectral or Infrared cameras; Calibrating the cameras; the Roll, Yaw and Pitch.
- iii. **Drone Mapping Processes:** Preparing for a flight; Ground Control Points; Image overlaps; Precautionary measures e.g. weather conditions etc.; An overview of eMotion and DroneDeploy software; The flight planning process.

- iv. **Field Data Capture/Mapping:** Safe launching of a drone; Controlling the drone remotely; Adjusting flight height and speed; Mapping process; Safe landing of a drone.
- v. **Drone Image Processing:** An overview of image processing software e.g. Pix4D, Agisoft; Image refinement; Computer hardware requirements; image processing workflows; error and accuracy assessments.
- vi. **Drone Mapping Products:** Overview of processed products from drone mapping; Creating Orthomosaics, DEMs, DSMs, digital contours and topographical maps.
- vii. **Data Storage on Geonode:** Drone image BIG data archiving, cataloging; retrieval and dissemination using Geonode GIS portal; Creating image tiles for fast loading via internet.

1.3.A Case Study Project

A fieldwork case study project at Karen Village involving flight planning, drone mapping, data processing; Report writing and submission of case study findings.

1.4. Expected Learning Outcomes

On completion of this course, the participants are expected to:

- i. Apply Drone Mapping concepts and broadly explain the benefits of using drone mapping technology as opposed to satellite images or aerial photos;
- ii. Describe the drone mapping process and workflows; its subsystems as well as get acquainted with the components of the drone & camera sensor types;
- iii. Learn how to choose a right drone for the specific job; get acquainted with flight planning workflows using eMotion software; drone operations i.e. safe launching and landing etc.
- iv. Get insights on how to carry out drone image processing to come up with outputs such as Orthomosaics, DSMs, DEMs including topographical maps;
- v. Acquire technical skills on how to work with drone images/BIG data specifically uploading the data to Geonode cloud server and develop a web GIS portal for data archivery, cataloging, retrieval, storage and dissemination.

1.5. Training Tools (Hardware and Software)

1. eBee SQ Drone;
2. Phantom 4 Pro v2 Drone;
3. Laptop or PC;
4. eMotion, DJI Go and Pix4D;
5. DroneDeploy;
6. Geonode;

1.6. Training Style and Approach

1. On-site instructor-led training;
2. On-line self-paced training (optional);
3. Use of PowerPoint Slides;
4. Fieldwork Drone Mapping;
5. Use of Case Study Videos.