

# GIS Training Curriculum

for Basic Learners

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## Summary Table

- Introduction to Geographical Information System- Concept definition
- Understanding data types & formats
- Data Collection & mapping using Global Positioning System
- Installation of ArcMap, ArcGISPro & QGIS
- Georeferencing
- Editing, Attribute table Population
- Querying – Attributes and Features
- Case Study, Assessment and Modules
- Cartography I and Map Design
- Sharing your maps

# Basic Track



## Basic Track

### Overview

In this basic training on Geographic Information System(GIS), you'll learn about what a GIS is,how to install and get started with some GIS software yourself, how things we find in the real world can be represented on a map, how we record locations using coordinates,how to capture coordinates with a GPS device, and how we can make a two-dimensional map. In the training project, you will choose to create your own GIS data by tracing geographic features from a satellite image for a location and theme of your choice or collecting/validating the data on the field using a GPS device. This course will give you a solid foundation in GIS, as well as give you the understanding needed to start working with GIS, and to succeed in the advanced training.

### Objectives

The objectives of this training are to:

- Familiarize you with the world of GIS
- Set up and install a GIS software on your computer
- Complete a project from ideation to presentation

### Required Materials

You will need a computer to install QGIS or ArcMap and a willing mind to learn!

### Assignment and Grading

The assignment structure for this course would be to;

1. Test your knowledge on the understanding of GIS;
2. Help you understand how it can be applied to solve a problem in your preferred field.

## Program Schedule: Basic Track

Section	Lessons	Description	Goals	Tasks
1	Introduction to GIS	<ul style="list-style-type: none"> <li>History of GIS(John snow,Roger Tomlison), why GIS &amp; LI is important</li> <li>Notable founders of GIS</li> <li>Outstanding examples of GIS applications</li> <li>Components of GIS</li> <li>GIS Data types (Raster, Vector)</li> <li>GIS Data formats (Shapefile, Geojson etc)</li> <li>GIS Softwares (QGIS, ArcMap)</li> <li>Companies using GIS and how they use it (Milsat, Google Maps, Esri etc)</li> <li>GIS Job prospects (Analyst, Developer, Manager etc)</li> <li>Different applications (Covid, Ebola, rapid response, disasters etc) and branches of GIS (Drones, City Planning, AR, Agriculture, Estate Management, Smart Cities etc)</li> </ul>	Provide a strong foundation on GIS and location intelligence.	An essay on your understanding of GIS and how it can be applied to your present field.
2	Software Installation	<ul style="list-style-type: none"> <li>ArcMap/ArcGISPro/QGIS overview and Installation</li> <li>Overview of the software</li> <li>Navigating the Interface</li> <li>Checking the help guide, online forums and other places to find help</li> <li>Installing plugins</li> <li>Setting up a projectworkspace</li> <li>General walkthrough</li> </ul>	Successful installation of at least a GIS software	A video recording or step by step guide on how to install your favourite GIS software.
3	Data acquisition methods in GIS	<ul style="list-style-type: none"> <li><b>Georeferencing of old maps</b> <ul style="list-style-type: none"> <li>Using Georeferencing tool in ArcMap/Georeferencer in QGIS</li> </ul> </li> <li><b>GPS</b> <ul style="list-style-type: none"> <li>Using the Garmin GPS to capture coordinates</li> </ul> </li> <li><b>Remote Sensing</b> <ul style="list-style-type: none"> <li>Where to download Imagery (Google Earth Pro, USGS Earth Explorer etc)</li> </ul> </li> <li><b>Drones</b> <ul style="list-style-type: none"> <li>How it works and general overview</li> </ul> </li> </ul>	A strong understanding of GIS data collection and conversion from various sources.	Based on the essay you wrote in section 1 above,acquire data using any data you feel GIS can use to tackle a challenge you are facing presently in your field. Write a report on why you acquired the data and links to the sources if any.

		<ul style="list-style-type: none"> <li>• IOT devices <ul style="list-style-type: none"> <li>◦ How it works and general overview</li> </ul> </li> <li>• Some data collection apps to use. when and where to use them for data collection.</li> <li>• The coordinate system <ul style="list-style-type: none"> <li>◦ Longitude and Latitude</li> <li>◦ Projections</li> <li>◦ Converting between Degree decimal and degree minutes seconds</li> </ul> </li> <li>• Converting CSV and importing in ArcMap or QGIS</li> </ul>		
4	Digitizing and Embellishment	<ul style="list-style-type: none"> <li>• Digitizing of georeferenced maps in ArcMap/QGIS.</li> <li>• Working with basemaps</li> <li>• Map embellishment 1. (Choropleth maps, color combinations, thematic maps,natural, breaks, symbology etc)</li> <li>• Designing maps with the QGIS/ArcMap layout.</li> <li>• The important cartographic map elements</li> <li>• Exporting and sharing your maps</li> </ul>	Design and convert a raw data to a shareable map.	Using the data captured above, embellish using the basic cartography elements and attractive color combination.
5	Spatial Query	<ul style="list-style-type: none"> <li>• Querying and populating the attribute table</li> <li>• Clipping and selection queries with vector data.</li> <li>• Join and buffer operations</li> </ul>	Able to gain quick insights in data by performing quick and simple queries.	From your newly acquired knowledge,what kind of analysis can you perform on the previously acquired data to get more insights?

## **Instructor**

- A member of the Milsat Technologies staff.

## **Training Methodology**

- Audiovisual content
- Document
- Assessment tasks

**Note:** The exercises in this training are continuous, the output of one is the input of another. Therefore it is important to pay proper attention to detail and follow through diligently.

