1. **Basic introduction of map**
2. Shape of Earth: Referenced globe
3. Projection
   * Reference globe
   * Projection surface
   * Standard line
   * Projection point
4. Coordinate System Type
   * geographic coordinate system
   * projected coordinate system
5. Coordinates and unit
6. EPSG, georeference parameters
7. Common coordinate system in Taiwan
   * 3826: TWD97 TM2 zone 121
   * 3824: TWD97經緯度坐標
   * 4326: WGS84
   * 3857: web mapping applications (e.g., Google Map, Open Street Map)

*Other keywords: Geoid, scale factor, datum*

1. **Basic introduction of Geographic Information System (GIS)**
   1. Definition: A framework for gathering, managing, analyzing, and visualizing spatial and geographic data (ChatGPT).
   2. Common file types:
      * Vector data: .shp + .shx + dbf + .prj + .cpg, kml, kmz
      * Raster data: .tiff, .geotiff
      * Text data: txt, csv, geoJSON
   3. Common software: QGIS, ArcGIS, SAGA, R
   4. Common terms
      * Feature: point, linestring, polygon, multipoint, multilinestring, multipolygon, geometrycollection
      * Attributes
      * Layer (圖層)
      * Geo-processing: buffer, merge, clip, intersect, union, dissolve, convexhull (凸包), mask, extract
      * DTM: DEM, DSM
      * Interface (介接), Map platform (圖台), WMTS, WMS, WFS

*Other keywords:*

1. **Basic QGIS, SAGA operation**
   1. Load data: vector, raster, text
   2. Georeference of layer, project (current map), and how to transform
   3. Interface: new connection
   4. Information of the layers
   5. Attributes of the features
   6. Adjusting properties of the layer
   7. Geo-processing: buffer, merge, clip, intersect, union, dissolve, convexhull (凸包), mask, extract
2. **GIS in R**
   1. Useful packages
      * tidyverse
      * sp, rgdal, rgeos
      * sf
      * terra
   2. Common terms
      * sfg
      * sfc
      * sf
      * st
      * st: spatial type
   3. Load data: vector, raster, text
   4. Set up and transform georeference
   5. Geo-processing: buffer, merge, clip, intersect, union, dissolve, convexhull (凸包), mask, extract
   6. Visualization
   7. Save the data
   8. Others
      * World map
3. **Useful sources**