All India Senior School Certificate Examination (AISSCE)

Geospatial Technology

CURRICULUM

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI.
Geospatial Technology (GT)
Class XI

Total Marks 100
(Theory 60 + Practical 40)

Theory

Chapter 1- Geospatial Overview 10 periods (5 marks)
- Introduction to Geospatial Technology
- Why to study Geospatial Technology
- Importance of Geospatial Technology

Chapter 2- Mapping & Cartography 20 periods (10 marks)
- What is Map & its Importance
- Map Scale and Types
- Elements of Map and Indexing
- Map Coordinate System
- Interpretation of Satellite Images

Chapter 3- Remote Sensing 30 periods (20 marks)
- Overview on Remote Sensing Technology
- Fundamentals of Remote Sensing
- Physics of Electro Magnetic Energy
- Remote Sensing Platforms, Sensors and Data Products
- Remote Sensing Applications
- Indian Remote Sensing Systems

Chapter 4- Geographical Information System 30 periods (20 marks)
- Fundamentals of GIS
- Components of GIS
- GIS Acquisition of GIS
- Data Types of GIS
- Application of GIS

Chapter 5- Ground Positioning System 10 periods (5 marks)
- Overview of GPS
- Functions of GPS
- Segments of GPS
- Accuracy of GPS
- Applications of GPS
Practical

Exercise - 1
- To map School building and surrounding environment

Exercise - 2
- To display the various types of thematic geological, political Meteorological and cadastral maps subject to availability
- To read the maps and identify Map features
- To learn usage of Maps

Exercise - 3
- To display two different scales of Toposheets of same area
- To read Toposheet index and identify the adjacent Toposheets
- To understand the small and large scale concepts
- To compare the same area coverage by two different scaled Toposheets
- To identify the different types of points line and polygon features
- To identify the map elements.
- To know the four coordinates of Toposheets
- To learn find out the location of any point.

Exercise - 4
- To display the satellite imagery and Toposheet of same area
- To identify the same features from Toposheet and Satellite image
- Compare the identified features with toposheets and satellite image.

Exercise - 5
- To understand the GIS environment for example open file, Display images and operate various functions such as zoom in, Zoom out, open attribute table and reading them overlay etc.

Exercise - 6
- To understand the GPS data collection and map them and Prepare table of coordinates and elevation of all points collected.
- Compare the results on Google map.
Chapter 1 - Remote Sensing (RS) 20 Marks 40 Periods

1.1. Introduction
1.2. Spectral Reflectance Signature
1.3. Digital Image Processing
1.4. Visual Interpretation of Satellite data
1.5. Aerial Photo and Its Interpretation
1.6. Advanced Remote Sensing Technologies
1.7. Advantages and Benefits of RS

Chapter 2 - Geographic Information System (GIS) 20 Marks 40 Periods

2.1 Introduction
2.2 GIS Data Element and Data Structure
2.3 Fundamentals of Database Concept
2.4 Data Input to GIS System
2.5 GIS Data Editing
2.6 Attribute Data Linking
2.7 Spatial and Non Spatial data Analysis
2.8 Map Projection and Coordinate System
2.9 Digital Cartography
2.10 Advantages and Benefits of GIS

Chapter 3 – Global Positioning System (GPS) 05 Marks 10 Periods

3.1 Introduction
3.2 GPS Accuracy and Accuracy factors
3.3 Types of GPS
3.4 List of Global Navigation System
3.5 GPS Today & Limitations of GPS
3.6 Uses of GPS Technology

Chapter 4 – Trends in Geospatial Technology (GT) 05 Marks 10 Periods

4.1 Introduction
4.2 Remote Sensing Trends & Technology
4.3 GIS Trends & Technology
  4.3.1 Web Based GIS
  4.3.2 Enterprise GIS
  4.3.3 Mobile GIS
  4.3.4 3-D Visualization and Flythrough
  4.3.5 Open GIS
4.4 GPS Trends & Technology

Chapter 5 – Applications of Geospatial Technology (GT) 10 Marks 20 Periods

5.1 Watershed Studies
5.2 Flood Studies
5.3 Groundwater Studies
5.4 Health Issues
5.5 Utility Studies
5.6 Security and Defense Studies
5.7 Urban and infrastructure Studies
PRACTICAL - 40

1. **Projection of Data**  05 Marks 10 Periods
   - Georeferencing
   - Coordinating System and components
   - Image to map registration
   - Image to image registration

2. **Digitization**
   - Building Topology

3. **Digital Image Processing**  05 Marks 20 Periods
   - Image enhancement
   - Unsupervised classification
   - Supervised classification

4. **Geospatial data creation and editing**  05 Marks 20 Periods
   - Querying (Location parameters, graphics etc)
   - Projection data
   - Building geodata base

5. **Spatial Analysis & Thematic Mapping**  05 Marks 20 Periods
   - Overlay analysis
   - Geoprocessing of data intersection, union dissolve, merge, clip
   - Functional attribute and expression
   - Statistics and Report generation

6. **Symbology & Layouts**  05 Marks 10 Periods
   - Map surfing
   - Preparing map and its layout
   - Indexing
   - Scale and annotation
Preparing maps for presentation

7. On Job Training

Preparation of maps for

- Environment analysis
- Urban area
- Water bodies
- Agriculture and Forest

Collecting ground truth with GPS

Overlaying of different maps in GIS