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**PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR  
UNIVERSITY, SOLAPUR**

**SKILL DEVELOPMENT CENTRE**



**Course Name: Certificate Course in Quantum GIS**

**Year- 2023**

**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**

**SKILL DEVELOPMENT CENTRE**

**“Certificate Course in Quantum GIS”**

**Syllabus**

**Duration of course:** 6 Months

**Need of Course:**

- This is an introductory course that covers QGIS from the very basics. You will learn to use QGIS for mapping, spatial data processing, and spatial analysis, etc.

**Employment and Entrepreneurship Opportunities from Course:**

- Top Quantum QGIS Job opportunities in various cities from Top Companies, Startups and also in Government Sector as QGIS Analyst / QGIS Data Analyst.

**Tentative Fees:** 4000/-

**Minimum Admission Eligibility for Student:** 12<sup>th</sup> Pass & admitted to B.A./B.Sc./M.A./ M.Sc.

**Teacher's Eligibility :** P.G. in Concerned Subject

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**SKILL DEVELOPMENT CENTRE**

**“Certificate Course in Quantum GIS”**

**Course Title: “Certificate Course in Quantum GIS”**

**Course Duration: 6 Months**

**Syllabus Structure**

Name of Skill Course	Duration	Name of Paper	Paper	Hours per Paper	Th.	Int.	Pract.	Credits
Certificate Course in Quantum GIS	6 Months	Introduction to Quantum GIS	I	45	80	20	0	3 Credits
		LAB-I	II	45	00	00	100	3 Credits
		Advances in Quantum GIS	III	45	80	20	0	3 Credits
		LAB-II	IV	45	00	00	100	3 Credits
Total				180	160	40	200	12 Credits

# **Punyashlok Ahilyadevi Holkar Solapur University, Solapur**

## **“Certificate Course in Quantum GIS”**

### **Syllabus**

#### **PAPER – I**

#### **(Introduction to Quantum GIS)**

##### **Unit I – Overview of QGIS**

- Introduction to QGIS, Objectives of QGIS, Application areas of QGIS, Key Components of QGIS – Hardware, Software, Procedure, Data & User, Functional, Requirements of QGIS, Installing QGIS, Limitation of QGIS

##### **Unit II- QGIS GUI**

- Menu Bar - Project, Edit, View, Layer, Setting, Plugins, Vector, Raster, Database, Web, Mesh, Processing, Help, QGIS Panels and Toolbars, Map View 3D Map View - Navigation option, Creating an animation, Scene Configuration, 3D Vector Layers Status Bar - Locator bar, reporting actions, Control the map canvas, Messaging

##### **Unit III – QGIS Configuraion**

- General Settings, System Settings, Transformation Settings, Data Sources Settings, Rendering Settings, Canvas and Legend Settings, Map tools Settings, Colors Settings, Digitizing settings, Layout Settings, Variables Settings, Code Editor Settings

##### **Unit IV – The Style Library,**

- The Style Manager - The Style Manager dialog, Setting a Color Ramp,
- The Symbol Selector - The symbol layer tree, Configuring a symbol
- Setting a label - Formatting the label text, Configuring interaction with labels
- Creating 3D Symbols - Point Layers, Line layers, Polygon Layers, Application example

##### **Unit V – Working with Vector Data and Raster Data**

- The Vector Properties Dialog - Information Properties, Source Properties, Symbology Properties, Label Properties, Diagrams Properties, Masks Properties, 3D Properties, Field Properties, Form Properties, Join Properties, Rendering Properties, Legend Properties, Digitizing Properties.
- Expressions - The Expression string builder, Function Editor
- List of Functions - Aggregates Functions, Array Functions, Color Functions, Conditional Functions, Conversion Functions, Custom Functions, Date and Time Functions, Fields and

Values, File and Path Functions, Form Functions, Geometry Functions, Maps Functions, Operators, Raster Functions, Record and attribute Functions.

- Editing - Topological editing, Digitizing existing Layer, Shape digitizing Export - Setting, Export as Image, SVG, PDF

**Books:**

1. Basudeb Bhatta,(2011), Remote Sensing and GIS (Second Edition), Oxford University Press.
2. S.M.Rashid, (1993), Remote Sensing in Geography, Manak Publication, Pvt. Ltd. Delhi.
3. Kang-Tsung Chang, Introduction To Geographic Information Systems, (Fourth Edition), Boston : McGraw-Hill
4. QGIS Desktop User Guide
5. Online Resources.

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## **“Certificate Course in Quantum GIS”**

### **Syllabus**

#### **PAPER – II**

#### **(LAB – I)**

**Topic 1:** Installation of QGIS and its Configuration Data Creation

**Topic 2:** Navigation – Map Navigation – Pan Map, Zoom In, Zoom Out, Zoom Layer, Zoom in Selection, Zoom Full Adding and Editing data to Map, Displaying and arranging Map Layers, Identifying Attributes, Viewing Data, Editing Layers and Customizing interface.

**Topic 3:** Add Raster Layer, Add Vector Layer, Create Vector Data, Adding Attribute Data

**Topic 4:** Utilize different Color Ramp on Maps, Setting and Formatting, Labels of the Map, Data Conversion and Exporting Data, Creating 3D Symbols on Map

**Topic 5:** Symbolizing Information and Setting Properties of Symbols, Setting different properties of Labels on Map, Design Form by using properties, Use different Legends on Map, Utilize different Functions, Topological Editing, Digitize Layer and then Export it in different formats

# **Punyashlok Ahilyadevi Holkar Solapur University, Solapur**

## **“Certificate Course in Quantum GIS”**

### **Syllabus**

#### **PAPER – III**

#### **(Advances in Quantum GIS)**

##### **Unit I – Working with Raster Data**

- Raster Properties Dialog, Information Properties, Source Properties, Symbology Properties, Transparency Properties, Histogram Properties, Rendering Properties, Pyramids Properties, Metadata Properties, Legend Properties, QGIS Server Properties.

##### **Unit II - Georeferencing and Digitization**

- Georeferencing of Toposheet / Map, Digitization of Toposheet / Maps – Point, Line and Polygon

##### **Unit III – Map Composition, Coordinate System and Projection**

- Concept of Map, Geographic Coordinate System, Map Projection, Symbology in QGIS

##### **Unit IV – Data Exploration**

- Data Exploration, Attribute Data Query, Spatial Data Query, Raster Data Query, Map-Based Data Manipulation

##### **Unit V –Working with Google Earth Using GIS**

- To introduce the Google Earth, Bing, Yahoo and Open street maps using Quantum GIS, Introduction to Bhuvan etc.

##### **Books:**

1. Basudeb Bhatta,(2011), Remote Sensing and GIS (Second Edition), Oxford University Press.
2. S.M.Rashid, (1993), Remote Sensing in Geography, Manak Publication, Pvt. Ltd. Delhi
3. Kang-Tsung Chang, Introduction To Geographic Information Systems, (Fourth Edition), Boston : McGraw-Hill
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## **“Certificate Course in Quantum GIS”**

### **Syllabus**

#### **PAPER – IV**

#### **(LAB – II)**

**Topic 1:** Managing Raster Data, Exploring and using vector and raster data, Symbology / Cartography

**Topic 2:** Georeferencing a Raster data, Geospatial Processing in QGIS – Ex- Counting number of Tree, Counting number of houses in a area etc.

**Topic 3:** Design, Map Page setup, Exporting and Print a Map

**Topic 4:** Count number of points in Polygon, Join attributes by Location, Make a map of the number of trees per capita, Use the data provided and geoprocessing tools to locate areas where the city should plant more trees.

**Topic 5:**

- Exporting shapefiles to Kml format and Opening in Google Earth
- Digitizing in Google Earth.
- Importing Kml file to shapefile by using QGIS
- Installing OpenLayer Pulgin