

**SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR**



**SYLLABUS EFFECTIVE FROM: 2018-19
(Under Choice Based Credit Scheme)**

(પીજી બીસી સી. ૦૩/૦૫/૨૦૧૭)

M. Sc. (Geoinformatics) – 3rd Semester Syllabus

Paper No.	Paper Title
PS03CGIN21	Spatial Data Infrastructure & Web GIS Services
PS03CGIN22	QGIS Tools and Applications Development
PS03CGIN23	Visual Programming
PS03CGIN24	Android & iPhone Applications Development
PS03CGIN25	Practical based on PS03CGIN22 and PS03CGIN24

Elective:

PS03EGIN21 Geoinformatics Application in Governance

PS03EGIN22 Geoinformatics Application in Utility Management

Paper No.: PS03CGIN21

Paper Title: SPATIAL DATA INFRASTRUCTURE & WEB GIS SERVICES

Unit 1 SDI Concepts

SDI Concepts, Nature and SDI Hierarchy, Global, National, Regional and Local SDI, SDI Contents, Building a SDI and use in Planning and Decision Making.

Unit 2 SDI Initiatives and Applications:

Global, National, Regional & Local SDI Initiatives, SDI Data Warehouse & Data Mining, Illustrative case studies of SDIs.

Unit 3 Web GIS Services

Concepts of Web GIS, Scalability, Quality of Service and Security Issues in Development of Web GIS Services, Thick, Medium & Thin Client based Web GIS services, Open source and Proprietary Web GIS tools

Unit 4 Open Geospatial Consortium

OGC concepts, Interoperable and Non-interoperable Systems, Metadata Standard, XML, Geographic Markup Language, OGC Compliant Web Map Service (WMS), Web Feature Service (WFS), Web Coverage Service (WCS).

Reference Books:

1. Korte,G. B., (2001) The GIS book: 5th Edition, Onward press, Australia. Cartwright, W., M.P. Peterson, G. Gartner (Eds) Multimedia Cartography, Berl: Springer.
2. Kraak,M., and A.Brown (2001) Web Cartography: Development and Prospects, London: Taylor and Francies.
3. Kraak, M. and F. Ormeling (2003) Cartography: Visualization of Geospatial Data, Delhi: Pearson Education.
4. Ron Lake, David S. Burggraf, Milan Trninic, Laurie Rae, 2004, Geography mark-up language (GML) John Wiley & Sons Ltd.
5. Developing Spatial Data Infrastructures: From Concept to Reality By Ian P. Williamson, Abbas Rajabifard, Mary-Ellen F. Feeney

Paper No.: PS03CGIN22

Paper Title: QGIS TOOLS AND APPLICATIONS DEVELOPMENT

Unit 1 Quantum GIS

QGIS Installation, QGIS GUI, General tools, QGIS Configuration, Working with Projection –Custom coordinate Reference System, Datum Transformation, QGIS Browser

Unit 2 Creation & Edition

Vector data- Editing, Query Builder, Field Calculator, Raster data –Properties, Raster Calculator, QGIS as OGC Data Client & Server, GPS Plugin, GRASS GIS Integration

Unit 3 Plugins & Customization

QGIS Plugin, DB Manager Plugin, GDAL tools Plugins, Georeferencer Plugins, Raster Terrain Analysis Plugin, Spatial Query Plugin, SQL Plugin, Developing customized Python Plugin, IDE Setting for scripting

Unit 4 Application Development

Creating NDVI, Creating Map Book, Collecting Field data, Geo locating photos on Map, Creating thematic projects for Environment, Urban, Climate Change and Disaster Management.

Reference Books:

1. <http://manual.linfiniti.com/LinfinitiQGISTrainingManual-en.pdf>
2. <http://docs.qgis.org/2.2/pdf/en/QGIS-2.2-UserGuide-en.pdf>
3. QGIS by Example, Alexander Bruy, Daria Svdzinska, Kindle Edition
4. QGIS Python Programming Cookbook, Joel Lawhead, Packt Publishing
5. Mastering QGIS, Kurt Menke, GISP, Richard Smith, Luigi, Pirelli, Jon Van Hoesen
6. Building Mapping Applications with QGIS, Erik Westra

Paper No.: PS03CGIN23
Paper Title: VISUAL PROGRAMMING

Unit 1

Introduction to .Net Framework Architecture

CLR, CTS, CLS, BLS
MSIL, Managed Code, Garbage Collection, Namespaces, Generics,
Collections

Assemblies

Private, Shared
Working with assemblies and the GAC

Introduction to .Net Technologies

Console Application, Windows Application, Web Applications, Smart
Device Applications etc. Introduction to WPF and WCF

Advanced Features of .Net

Multithreading
Remoting & Network Programming
Custom Controls

Unit 2

Fundamentals of C# .Net

Syntax, data types, variables, predefined data types, Flow Controls,
Enumerations, Arrays, Preprocessor Directives
Classes, Structures

Fundamentals of OOPs

Inheritance, Polymorphism, Interfaces, Delegates

Error and Exception Handling

Unit 3 Windows Forms and Windows Presentation Foundation

Creating a Windows Form Application
Form Class and Control Class
Standard Controls
Creating Menus and Toolbars
MDI, XAML
Shapes, Controls
Layouts, Styles
Data Binding
Window Forms Integration

Unit 4

Database Access for .Net

ADO .Net Overview
ADO .Net in Connected Architecture
ADO .Net in Disconnected Architecture
Viewing .Net Data
Generating Reports

Reference Books:

1. Beginning/Professional C# with .Net 3.0 - Wrox Publication

Paper No.: PS03CGIN24
Paper Title: ANDROID & I PHONE APPLICATIONS DEVELOPMENT

Unit 1 Introduction to Android, Activities and User Interface Design

Introduction to Android, Standard development environment for Android applications
Installing Android, Creating Hello World and running application on Emulator
Android Architectural Overview and Android Development Framework,
Introduction to Android tools, Structure of Android application, Components of Android, Introduction to activity, Activity lifecycle phases, Introducing Toast, Introduction to Views and layouts and Common UI components, Input and Selection components, Adapters, Menus and Dialogs
Working with Intents, Types of Resources

Unit 2 Introduction to Content Provider and Sqlite Database

File systems, Persistent storage in Android, Android databases
Storing and retrieving data, Content provider Classes

Unit 3 Introduction to iPhone

iPhone Application Development Process
Introduction Objective C
Data Types in Objective C
Enum Data Type, NSNumber, NSInteger, Operators
Statements in Objective C, If- else-if...and an else Statement, The Switch Statement, Loop
Inheritance, Mutable String and Immutable String, NSArray, NSMutableArray Array, NSDictionary
NSMutableDictionary, File I/O, Comments in Objective C

Unit 4 Mobile Application Development

Framework& Platform, Simulator, Creating Simple Interface, XML Interface Builder (XIB)
NeXT Interface Builder (NIB), Adjusting the UI, Using the Application Delegate
IBOutlets, IBActions, Implementing a Button Action, Properties
iPhone Application, Managing Application Memory, View Controllers

Reference Books:

1. Beginning Android Application Development By Wei-Meng Lee, Wiley Publishing, Inc, Wrox Programmer to Programmer
2. iPhone Application Development All-In-One For Dummies by By Neal Goldstein, Tony Bove
3. iPhone and iPad Apps for Absolute Beginners by Rory Lewis.

Paper No.: PS03EGIN21
Paper Title: GEOINFORMATICS APPLICATIONS IN GOVERNANCE

Unit 1 Introduction

Meaning of Governance, Concepts of Governance
Implementing Governance Projects
GIS Data Management
GIS based Governance Services

Unit 2 The Challenges of Governance

A prerequisite of good Governance
Governance in Democratic set-up
Governance Infrastructure
Security concerns

Unit 3 Public Administration

Public Administration Concepts
Good Governance in G2G, G2C, G2B Services
Case studies for G2G, G2C, G2B

Unit 4 Governance & Policy

Governance Policy Guidelines
Governance Projects in State Governments
Governance Projects in Central Government

Reference Books:

1. M.G. Gupta and R.K. Tiwari (eds.), Reinventing the Government, IIPA, 1998
2. Jan Erik Lane, New Public Management, Rout ledges, 2000
3. IJPA Special No. on “Indian Theory and Public Administration”, July-September, 2000
4. Articles on Indian Theory, E-Governance and Good governance for IJPA, ISDA Journal and Administrative Change.
5. IJPA Special No. on “Towards Good Governance”, July-September, 2000

Paper No.: PS03EGIN22

Paper Title: GEOINFORMATICS APPLICATION IN UTILITY MANAGEMENT

Unit 1 Concepts of Utility Management

Concepts, Description of Utilities Services, Utility Spatial Database Design, Illustrative Utility Data Models.

Unit 2 Utility Data Acquisition

RS Data, GPS Data, LIDAR Data, Conventional Maps, SCADA Data and Data Integration

Unit 3 Utility Data Manipulation and Analysis

Utility Database Visualization, Browsing, Query, Analysis, Manipulation & Reports

Unit 4 Case Study

Electricity, Telecommunication, Water Supply Systems and Utility Project Management

Reference Books:

1. GIS Based Distributed System Planning, Analysis and Asset Management Volume 1
March 2006.

Paper No.: PS03CGIN25

Paper Title: Practical Based on PS03CGIN22 and PS03CGIN24