**Course: B.A. (Honors)**

**Paper: Geographic Information System (SEC)**

**Semester: III**

**Taught individually or shared: Individually, other groups by Dr. Gargi Majumdar and Md. Arif Hussain**

**Faculty: Dr. Ankur Srivastava**

**Number of classes per week: 6 lectures**

**Course Objectives:**

**1. The course aim is to give basic understanding of concept of GIS, its definitions and**

**components;**

**2. To gain working experience geographical data collection using GPS;**

**3. To do analysis and application of geographical data in land use, urban sprawl, and forest**

**study.**

**Unit 1:** **Geographical Information System (GIS): Definition and Components**

Topics to be covered: **(Week 1)**

* An introduction to GIS in relation to various geographical queries
* Understanding GIS as a problem solving tool
* Defining various components of GIS in detail

**Number of classes required:** 6 classes

**Methodology for teaching:** classroom sessions and power point presentation, selective reading for detail information about GIS

**Readings prescribed:**

1. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
2. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press

**Unit 2:** **Global Positioning System (GPS): Principles and Uses**

Topics to be covered: **(Week -2)**

* Introduction to GPS and principles involved in its functioning
* Different uses of GPS and DGPS worldwide

**Number of classes required:** 6 classes

**Methodology for teaching:** classroom sessions, field session with handheld GPS

**Suggested readings:**

1. Heywoods, I., Cornelius, S and Carver, S., (2006): An Introduction to Geographical Information system. Prentice Hall.

**Unit 3:** **GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.**

Topics to be covered: **(Week -3)**

* Defining various types of data structure associated with GIS (Spatial –Non Spatial)
* Raster and Vector data sets in detail

Number of classes required: 6 classes

Methodology for teaching: Virtual classroom sessions and illustrations through power point presentation, examples from real world

**Reading prescribed:**

1.Gomarasca, M. A. (2009) Basics of Geomatics, Springer Science, New York

**Unit 4:** **GIS Data Analysis: Input; Geo-Referencing; Editing, Output and Query; Overlays.**

Topics to be covered: **(Week 4-6)**

* Raster and Vector data input in GIS software
* Geo referencing of a given base map including digitization and associated features

**Number of classes required**: 18 classes

**Methodology for teaching:** Screen sharing for practical demonstration of geo-referencing and digitization processes, online tutorials available for further reference

**Readings prescribed:**

1. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press.
2. Chauniyal, D.D. (2010): Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad

**Unit 5:** **Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring.**

Topics to be covered: **(Week 7-9)**

* Defining the difference between land use and land cover
* Application of GIS in various academic domains specially Geography and Environment
* Use of GIS in contemporary issues like urban sprawl and forest monitoring

**Number of classes required:** 18 classes

**Methodology for teaching:** Quoting examples from various geographical perspective, geographical issues and use of GIS for addressing the issues. Online training session on QGIS

**Readings prescribed:**

1. Jha, M.M. and Singh, R.B., (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept

**Regular assessment of PRACTICAL FILE will be done on weekly basis.**

**Criteria of Assessment:**

* Class tests
* Assignment

Tentative Dates of Assessment:

* Assignment- To be submitted before November 10, 2022
* Class test – October 10, 2022 and 1st week of November, 2022

e-resources:

<https://gisgeography.com/best-free-gis-data-sources-raster-vector/>

<https://www.esri.com/en-us/home>

<https://guides.lib.berkeley.edu/publichealth/phgis>

<https://www.gislounge.com/web-based-gis/>

<https://education.nationalgeographic.org/resource/geographic-information-system-gis>