**SHYAMA PRASAD MUKHERJI COLLEGE (FOR WOMEN)**

**Department of Geography**

**TEACHING PLAN – July 2022 to November 2022**

Course: **BA (Honours)**

Semester: **Vth**

Subject: **Remote Sensing and GIS (Practical)**

Taught individually or shared: **Shared with Individual groups**

Faculty: **Mr. Aakash Upadhyay/ Ms. Maansi Malik/ Md. Arif Husain**

Number of classes per week: **6**

**Course Objectives:**

1. The course aim is to give basic technical knowledge and practical experience in digital remote sensing.

2. Knowledge and practical experience in handling satellite images focusing on hands-on experience of image pre-processing, enhancement and classification;

3. Better understand the techniques for the study of land use land cover and urban study.

**Learning Outcome:** This is a practical, hands-on course; when you have completed it, you will be able to:

1. Explain principles of remote sensing, different satellite systems and sensors;

2. Perform image pre-processing, enhancement and classification and interpretation of satellite images;

3. Apply Image preprocessing for land use land cover and urban studies;

Unit 1: **Remote Sensing and GIS: Definition and Components, Development, Platforms and Types.**

Topics to be covered:

* **Week 1 (21/7/2022- 29/7/2022)**: **Remote Sensing and GIS: Definition and Components**
* **Week 2 (1/8/2022 – 5/8/2022):** **Remote Sensing and GIS: Development, Platforms and Types.**
* **Week 3 (8/8/2022 – 12/8/2022)**: **Remote Sensing and GIS: Development, Platforms and Types**

Number of classes required: 16 classes

Methodology of teaching: Power-point presentation, Demonstration, Interactive Lectures and detailed discussion

Unit 2: **Aerial Photography and Satellite Remote Sensing: Principles, Types and Geometry Aerial photograph; Principles of Remote Sensing, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat and IRS) and Sensors**

Topics to be covered:

* **Weak 4 (22/8/2022 – 26/8/2022):** **Principles, Types and Geometry of Aerial Photograph**
* **Week 5 (29/8/2022 – 02/9/2022): Principles of Remote Sensing, EMR Interaction with Atmosphere and Earth Surface**
* **Week 6 (05/9/2022 – 09/9/2022): Satellites (Landsat and IRS) and Sensors**

Number of classes required: 16-18 classes

Methodology of teaching: Power- point presentation, Interactive Lectures, detailed discussion, Practice for photo geometry and scale.

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

Topics to be covered:

* **Week 7 (12/9/2022 – 16/9/2022):** **Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure**

Number of classes required: 6 classes

Methodology of teaching: Power- point presentation, Interactive Lectures, detailed discussion, live demonstration and practise session

Unit 4: **Image Processing (Digital and Manual) and Data Analysis: Pre-processing (Radiometric and Geometric Correction), Enhancement (Filtering); Classification (Supervised and Un-supervised), Geo-Referencing; Editing and Output; Overlays**

Topics to be covered:

* **Week 8 (19/9/2022 – 23/09/2022): Pre-processing (Radiometric and Geometric Correction), Enhancement (Filtering);**
* **Week 9 (26/09/2022 – 30/09/2022): Classification (Supervised and Un-supervised), Geo-Referencing** **and Practise session**
* **Week 10 (10/10/2022 – 14/10/2022): Editing and Output and Overlays**
* **Week 11 (17/10/2022-21/10/2022):** **Practice session of things done for fourth units along with revisions.**

Number of classes required: 18-20 classes

Methodology of teaching: PowerPoint presentation along with explanation of the concept with practice exercises

Unit 5: **Interpretation and Application of Remote Sensing and GIS: Land use/ Land Cover, Urban Sprawl Analysis; Forests Monitoring**

Topics to be covered –

* **Week 12 (24/10/2022 – 28/10/2022): Application of Remote Sensing and GIS**
* **Week 13 (31/10/2022 – 04/11/2022):** **Land use/ Land Cover**
* **Week 14 (07/11/2022- 11/11/2022):** **Urban Sprawl Analysis**
* **Week 15 (14/11/2022- 18/11/2022):** **Forests Monitoring**
* **Review, Practices and Corrections to be carried on along with chapters/units.**

Number of classes required: 24 classes

Methodology of teaching: Live demonstration, Explanation of the concept with practice exercises

**Prescribed Reading: Apart from handouts, PPTs given**

* Burrough, P.A., and Mc Donnell, R.A. (2000) Principals of geographic information system – spatial information system and geo-statistics: oxford university press.
* Chauniyal, D.D. (2010) Sudur samvedan evam bhogolik suchana pranali, sharda pustak Bhavan Allahabad.
* Nag.P. (2008) Introduction to GIS, concept India, New Delhi.
* Singh, R.B. and Murai, S. (1998) space informatics for sustainable development, oxford and IBH, New Delhi.
* Heywoods,i. corbelius ,S and Carver(2006) An introduction to geographical information system. Prentice Hall.
* Bhatta, B. (2010) Analysis of urban growth and sprawl from remote sensing, springer, Berlin Heidelberg.

**Criteria of Assessment:**

1. Class tests – 10 marks; Two tests (Best will be evaluated)
2. Assignment – 10 marks
3. File – 25 marks

Tentative Dates of Assessment:

* Assignment- October 15, 2022
* Class Test I – September 08 September 2022 (conducted already)
* Tentative Class Test II – November 1st Week
* Pre-Final test- Third week of November

Note: File work will begin in October, and final bound files will be submitted in the department by 3rd week November, 2022.