ADD ON Course

Organised by

Department of Geography and Department of Computer Science

Session 2022-2023

Course Title : REMOTE SENSING & ARTIFICIAL INTELLIGENCE

Objectives of the course :

- Everyone should understand about the basic principles, applications of Remote Sensing and Artificial Intelligence.
- Everyone should understand how geographical information is used and related with Artificial Intelligence.
- Everyone should understand about the basic principles of AI and related areas.
- Everyone should understand how to use AI in Remote Sensing.
- Everyone should understand how to apply Artificial Intelligent on remote sensing and GIS.

Course Coordinator

- **Bidisha Barua**
  Assistant Professor, Department of Geography, Dinabandhu Mahavidyalaya, Bongaon
- **Susobhan Ghosh**
  Assistant Professor, Department of Computer Science, Dinabandhu Mahavidyalaya, Bongaon

General Information

Duration : 40 hours

Entry Qualification : Honours and General Students of Geography and Pure Science

Language : Bengali / English

Venue : Dinabandhu Mahavidyalaya, Bongaon

Biswajit Ghosh
Principal
Dinabandhu Mahavidyalaya
Bongaon, 24 Pgs (N)

SYLLABUS OF

REMOTE SENSING & ARTIFICIAL INTELLIGENCE

- **Concept of Remote Sensing:**

  Introduction of Remote Sensing, Definition, Remote Sensing Art or Science, Remote Sensing Process, Source of Energy, Interaction with Atmosphere, Application of Remote Sensing, Advantages of Remote sensing, Limitation of Remote Sensing, Ideal Remote Sensing System

- **Types of Remote Sensing and Sensor Characteristics**

  (Classification Based on Platform, Classification Based on Energy Source, Classification Based on Imaging Media, Classification Based on Electronic Magnetic Spectrum, Classification Based on Number of Bands, Remote Sensing Satellites, Concept of Swath, Concept of Nadir, Sensor Resolutions: Spatial, Spectral, Radiometric, Temporal, Image Referencing System: Path, Row and Orbital Calendar.

- **Visual Image Interpretation:**

  Information Extraction by Human and Computer, Remote Sensing Data Products, Border or Marginal Information, Image Interpretation, Elements of Visual Image Interpretation, Interpretation Keys

- **Digital Image Processing:**

  Categorization of Image Processing, Image Processing Systems, Data Formats of Digital Image, Display of Digital Image, Pre-Processing (Radiometric Correction and Geometric Correction of Remotely Sensed Data), Image Enhancement, Image Transformation, Image Classification

- **Application of Remote Sensing:**

  Land-Cover and Land-Use

- **Applications and Techniques of GIS :**

  Data representation by QGIS
  Georeferencing, digitization, Data Representation through thematic mapping.

- **Artificial Intelligence**

  Fundamentals of AI and machine learning
  Deep learning algorithms: Decision tree and random forest
  Artificial neural network and convolutional neural networks (CNN)

- **Artificial Intelligence in Remote Sensing**

  Satellite data characteristics, Training and validation of a model,
  Overview of AI for remote sensing

Biswajit Ghosh
Principal
Dinabandhu Andrews College

Course Schedule

Name of the Faculty	Topic	Time
Bidisha Barua	**Concept of Remote Sensing:** Introduction of Remote Sensing, Definition, Remote Sensing Art or Science, Remote Sensing Process, Source of Energy, Interaction with Atmosphere, Application of Remote Sensing, Advantages of Remote sensing, Limitation of Remote Sensing, Ideal Remote Sensing System	4 hour
Bidisha Barua	**Types of Remote Sensing and Sensor Characteristics** (Classification Based on Platform, Classification Based on Energy Source, Classification Based on Imaging Media, Classification Based on Electronic Magnetic Spectrum, Classification Based on Number of Bands, Remote Sensing Satellites, Concept of Swath, Concept of Nadir, Sensor Resolutions: Spatial, Spectral, Radiometric, Temporal, Image Referencing System: Path, Row and Orbital Calendar.	4 hour
Bidisha Barua	**Visual Image Interpretation:** Information Extraction by Human and Computer, Remote Sensing Data Products, Border or Marginal Information, Image Interpretation, Elements of Visual Image Interpretation, Interpretation Keys	4 hour
Bidisha Barua	**Digital Image Processing:** Categorization of Image Processing, Image Processing Systems, Data Formats of Digital Image, Display of Digital Image, Pre-Processing (Radiometric Correction and Geometric Correction of Remotely Sensed Data), Image Enhancement, Image Transformation, Image Classification	8 hour
Bidisha Barua	**Application of Remote Sensing:** Land-Cover and Land-Use	2 hour
Dr. Raja Majumder	**Applications and Techniques of GIS :** Data representation by QGIS Georeferencing, digitization, Data Representation through thematic mapping.	8 hour

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Name of the Faculty	Topic	Time
Susobhan Ghosh	**Artificial Intelligence** Fundamentals of AI and machine learning Deep learning algorithms: Decision tree and random forest Artificial neural network and convolutional neural networks (CNN)	5 hour
Susobhan Ghosh	**Artificial Intelligence in Remote Sensing** Satellite data characteristics, Training and validation of a model, Overview of AI for remote sensing	5 hour

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