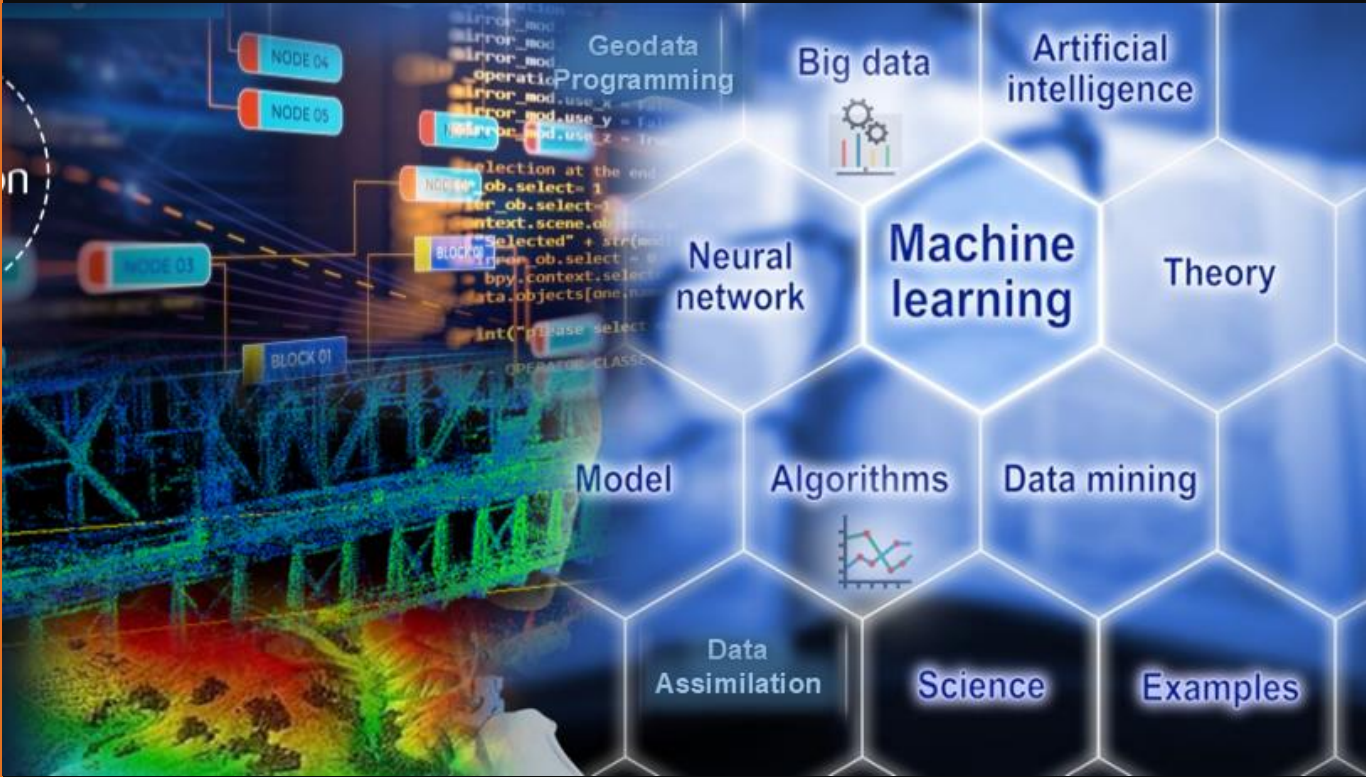




# ANNOUNCEMENT

# BROCHURE

# Post Graduate Diploma in Spatial Data Science



**Course Duration**

**12 Months**



Indian Institute of Remote Sensing  
 Indian Space Research Organisation  
 Department of Space, Government of India  
 4- Kalidas Road, Dehradun, India  
 Tel- +91- 135-2524110  
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## SPATIAL DATA SCIENCE

Geospatial technique has its own niche for solving various real life problems and find its application in disciplines like natural resource, disaster management & monitoring, big-geo data analytics, Artificial Intelligence (AI) applications for smart solutions: healthcare & location services, smart transportation, defense & strategic applications, geo-fencing, etc.

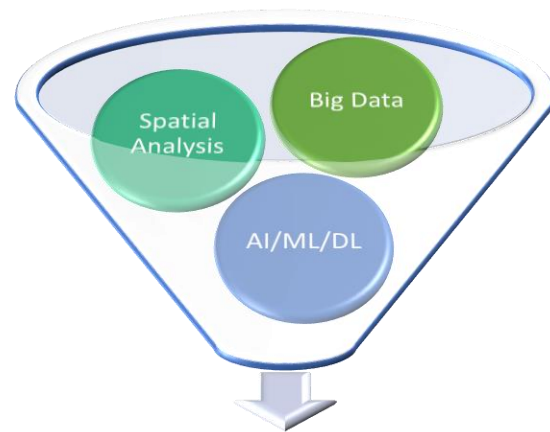
Recently with the advent of new data collection methods (mobile, sensor networks, unmanned aerial vehicles, micro satellites) as well as open data and crowd data have made geospatial data –big, characterized not only by the volume, velocity and variety but also by the increased detail and complexity of the data. New Challenges have emerged from this rapid expansion in data and tools options: how to scale analyses for the ‘big’ data; deal with uncertainty and quality for data synthesis; evaluate options and choose the right data or tool; integrate options; and use emerging tools to effectively collaborate on increasingly more multidisciplinary and multi dimensional research that aims to address our current societal and environment challenges.

Conventional geospatial techniques have paved way for Spatial Data Science to handle such data intensive applications. Spatial data science provides a platform to learn about concepts and principles required for handling spatial data and associated algorithms

### LEARNING OBJECTIVES

- Understand the concept of spatial data science, spatial data acquisition, analysis, modelling and geo-visualization in large data environments;
- Understand how artificial intelligence, machine learning, and data mining techniques can be used in knowledge discovery to provide solutions for geographical or location specific problems;
- Understand the concept of seamless data access from online data repositories, Web services and APIs for data analytics, processing, modelling and simulations.
- Applying the data science skills for solving real world problems.

### SKILLS YOU WILL GAIN



### CAREER IN SPATIAL DATA SCIENCE

Carrier opportunities are as follows:

- Data Scientists;
- Researcher;
- Spatial data analyst;
- Spatial data modeller;
- GIS Engineer/Developer;
- Market Analyst;
- Defence and strategic planner; and
- Many more challenging job profiles

### ELIGIBILITY CRITERIA

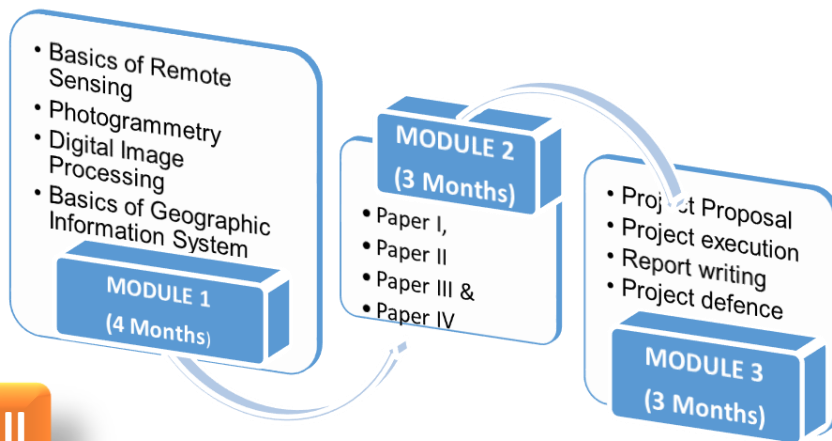
- M.Sc./M.Tech. in Comp. Sci./ IT/ Computer Application or equivalent with Bachelor's degree in Science (with Science & Maths subjects) or Engg. (OR)
- M.Sc. in Phy./ Maths/ Stat./ Geoinform. or equivalent) with Bachelor's degree in Science (with Science & Maths subjects) or Engg. (OR)
- B.E./B.Tech. in Comp. Sci./ IT/ Civil/ Electron./ Geoinform. or equivalent

### WHO SHOULD ATTEND?

- Students, researchers and professionals from engineering in computer science and information technology, Physics, mathematics and statistics looking for a career opportunity in spatial data science



# Course Structure & Contents



## Module II

### Paper-1: Big Data Analytics:

- Understand the concept of big data and its dimensions;
- Understand the challenges in handling and processing the big geo-data;
- Understand the distributed processing framework in cluster computing (Ex. Hadoop ecosystem) for big data analytics;
- Apply spatial data mining techniques for geographical problems;
- Understand the importance of spatial data cube concept and its applications;
- Describe the uses of big data analytics in various thematic areas.

### Paper-2: Machine Learning:

- Understand linear algebra, information theory and numerical computation for machine learning;
- Understand the concept of various machine learning approaches for Earth observation data and unconventional sensor data;
- Understand and apply regression and tree based approaches, Unsupervised learning, Supervised learning and Fuzzy Algorithms and Reinforced learning for classification, prediction and identification of classes and objects.

### Paper-3: Programming Skills Development for Geo-Processing:

- Develop complex Python code;
- Solve analytical problems using code in basic python programming;
- Understand usefulness of Numpy, Matplotlib, and geospatial packages to undertake geospatial tasks using Python and its libraries;
- Implement machine-learning algorithms using Python.

### Paper-4: Spatial Modeling and Data Assimilation:

- To understand the concepts of spatial modeling and their architectures;
- To understand the process and procedures in application of spatial models for real world problems;
- To understand the concepts and techniques of data assimilation and its application in spatial models;
- To understand the concepts of global and regional models, their configuration, components & applications.

## PROJECT WORK

- Three months project work.

*Learning from data is virtually universally useful. Master it and you will be welcomed nearly every where.*

*John Elder, Elder Research*

## About IIRS

The Indian Institute of Remote Sensing (IIRS) is a constituent unit of Indian Space Research Organisation (ISRO), Department of Space, Govt. of India. Since its establishment in 1966, IIRS is a key player for training and capacity building in geospatial technology and its applications through training, education and research in Southeast Asia. IIRS is also one of the most sought after Institute for conducting specially designed courses for the officers from Central and State Government Ministries and stakeholder departments for the effective utilization of Earth Observation (EO) data.

Website- <https://www.iirs.gov.in>



## Course Duration & Fee

- Course Start Date: Will be announced shortly
- Course End Date: Will be announced shortly
- Course Fee for Self Financed candidates (INR): ₹72000
- Course Fee for Govt. sponsored candidates (INR): NIL
- Course Fee for foreign candidates(USD): \$7200 (USD)
- Application Fee: ₹1,000/- (Rupees One Thousand only)

## How to Apply?

- The candidate can apply through <https://admissions.iirs.gov.in>
- Only online applications are accepted.
- **Last Date to apply**: 10.04.2021 [17:30 hrs]

**More details at:**  
<https://www.iirs.gov.in>



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