विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
DST- TEC, Pantnagar

## 3 MONTHS ONLINE CERTIFICATE COURSE (BATCH 4)

# DATA SCIENCE AND AGRICULTURE

**A unique first of its kind initiative integrating data science in agriculture**

**Starting from**

**20 JULY, 2026**

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**An initiative of DST-Technology Enabling Centre**

**G.B. Pant University of Agriculture and Technology, Pantnagar**

## ABOUT THE COURSE

The DST - Technology Enabling Centre (TEC) of G.B. Pant University of Agriculture and Technology, Pantnagar is launching a three months online course on '**Data Science and Agriculture'** from July 20, 2026 to October 20, 2026. The course is open for all undergraduate, postgraduate, and doctoral students as well as for interested young professionals of all State Agricultural Universities (SAUs), ICAR Institutes, Central Universities, other State Universities and higher education institutes. In the present context, Data Science is an emerging field with immense scope in agriculture and allied sciences. To cater to modern day challenges in agriculture, it is important that agriculture students and academic professionals have knowledge about emerging technologies. In this context, this three months certificate course has been conceptualized to update and upskill the students and academic professionals who are pursuing higher education or practicing or have interest in agriculture and allied disciplines. Three batches of this certificate course were successfully completed enriching about 100 participants in each batch. Building on the success of the previous batches, the "Data Science and Agriculture" online certificate course continues to equip participants with essential skills in data science for agriculture. The three months have a comprehensive course outline with online lectures, hands-on skilling sessions, expert talks, mentoring discussions, problem solving sessions and so on. The course will definitely induce a new set of knowledge among the learners and will also empower learners to effectively apply data science concepts in agricultural practices.

## COURSE CURRICULUM

- Introduction to Machine Learning, Types of Machine Learning, Real-world applications of Machine Learning
- Python Programming Basics, Python Syntax and Semantics, Error Handling and Exceptions and Data Structures in Python
- Data Manipulation and Visualization; Introduction to Libraries for Data Science, Data Cleaning and Preprocessing, Data Transformation
- Supervised Learning; Regression, Evaluation Metrics (MSE, RMSE, R-squared). Classification; Logistic Regression, k-Nearest Neighbors (k-NN), Decision Trees. Model Evaluation
- Unsupervised Learning and Advanced Topics such as Clustering, Introduction to Dimensionality Reduction, Principal Component Analysis (PCA), t-SNE
- Foundations of AI and ML in Agriculture; Precision agriculture for optimizing crop yield through IoT sensor data. Differences between AI, ML, and Data Science
- Historical Development and Current Trends; Key milestones and current trends in AI/ML relevant to agriculture, Identify major historical milestones. Understand the progression of AI technologies
- Importance and Impact of AI/ML in Agriculture; Benefits of AI/ML for agriculture, Examples of AI applications in agriculture, understand specific benefits for agriculture, Analyze real-world agricultural AI applications
- Types of Machine Learning in context of agriculture, Key ML Algorithms: Decision trees for crop disease detection from satellite imagery. Evaluation Metrics and Model Performance; Metrics like accuracy, precision, and recall in evaluating agricultural ML models

- Data Management and Preprocessing from Agricultural Sources, Integration of IoT sensor data for real-time, farming decisions. Data Storage Solutions; Importance of data privacy, GDPR and other data protection regulations, Best practices for data security

- Advanced AI Techniques for Agriculture; Predictive Modelling for Agriculture. Crop Yield Prediction; Time series forecasting models for predicting seasonal crop yields, Real-world examples of yield prediction systems, Soil sampling and analysis techniques, ML models for soil nutrient prediction, Mapping soil health indicators, Weather Prediction Models

- Data sources for weather forecasting (e.g., meteorological data), Building weather prediction models, Impact of weather on agricultural planning. Integration of IoT Sensors; Types of sensors used in agriculture (e.g., soil moisture, temperature), Collecting and analysing sensor data, Creating a sensor network for real-time monitoring

- Pest and Disease Detection - Image Recognition and Computer Vision; Using CNNs for pest and disease detection, Annotating and training image datasets, Early Detection Models, Image Analysis and Computer Vision, Satellite and Drone Imagery Analysis, Disease and Pest Detection Using Computer Vision

- Advanced Machine Learning Models; Deep Learning Applications in Agriculture: RNNs, Convolutional Neural Networks (CNNs); Architecture and components of CNNs, Applications in image processing, Training and fine-tuning CNN models

- Natural Language Processing (NLP) in Agriculture; NLP Applications in Agriculture, Text Mining and Sentiment Analysis for Market Trends, Language Translation for Farmer Communication, Chatbots for Farmer Assistance

## COURSE DELIVERY METHODS

1.Live Online Classes on Zoom
2.Live Hands-on Skilling Sessions
3.Fortnightly Expert Talks and Industry Insights
4.Problem Solving and Discussion Sessions
5.Projects and Case Studies
6.Assignments and Quizzes
7.Peer Review

## ELIGIBILITY

Open for all undergraduate, postgraduate, and doctoral students as well as for interested young professionals of all State Agricultural Universities (SAUs), ICAR Institutes, Central Universities, other State Universities and higher education institutes.
**Desirable**: Working knowledge of computer and internet

# EMINENT EXPERTS

**Mr. Bohitesh Misra**
Co-Founder & CTO, Avexa Systems Pvt. Ltd.

**Mr. Gaurav Pant**
Microsoft Certified Trainer, ACTECAL

## GUEST LECTURES BY RENOWNED ACADEMICIANS

***Dr. Bhushan Pal Singh***
***Scientist Engineer SF***
***Indian Space Research Organization***

***Mr. Devpal Singh***
***Senior Vice President***
***Niveshan Technologies India Pvt. Ltd.***

***Ms. Goldi Tewari***
***Data Scientist***
***Populus Group, United States***

***Dr. Santosh Kumar***
***Scientist-G & Group Director***
***IIRS, ISRO***

***Dr. Neeraj Budhlakoti***
***Scientist, ICAR-IASRI***

***Dr. Vivek Sahukar***
***Research Associate***
***Arizona State University***

***Mr. Rajeev Tomar***
***Director***
***Roshni Agri Information Pvt. Ltd.***

***Mr. Anup Uniyal***
*Sta**ff Software Engineer***
***GridAstra**, Hyderabad*

***Dr. Vikas Mishra***
***Post Doctoral Research Fellow***
***Auburn University***

# REFELCTIONS FROM THE FIRST BATCH OF PARTICIPANTS

*“The course on Data Science and Agriculture was highly informative and well-structured. It provided a comprehensive overview of how data science can be applied to agricultural practices, covering both theoretical concepts and practical applications. The inclusion of hands-on projects and real-world examples was indeed remarkable. Overall, the course met my expectations and equipped me with practical skills and knowledge that will be beneficial in my future endeavors.”*

***- Dr. Swati Verma, Senior Research Fellow, CCS Haryana Agricultural University, Karnal***

*“The Data Science course was a complete package of theory, hands-on learning experience with clear explanations, practical projects, and strong tutorial support - making complex topics approachable. It effectively prepared me with the required market skills, hence providing an added advantage in my profile.”*

***- Mr. Tharun Kumar, PhD Scholar, Professor Jayshankar Telangana Agriculture University, Hyderabad***

“*The experts of the Data Science course were highly knowledgeable. They taught the concepts of programming and data science in a very systematic way, especially to all students of agriculture background. Their efforts were extremely praiseworthy.”*

***- Ms. Anshita Tiwari, Agriculture Graduate, Indira Gandhi Agricultural University, Raipur***

“*The three months course on Data Science and Agriculture covered a wide range of topics with a beautiful blend of agriculture specific use cases. I really appreciated and enjoyed all the hands-on assignments which greatly enhanced my learning experience.”*

***-Mr. Dolgobinda Pal, Ph.D. Research Scholar, Bidhan Chandra Agricultural University, Nadia***

“*The online course on data science initiated by DST-TEC, Pantnagar was very comprehensive and effective. It really helped me to understand better ways of data visualization, data interpretation and data analysis through existing libraries of Python language. The course was very well designed and provided enough sessions for personal interaction and query resolution with the experts.”*

***- Dr. Abhishek K. Tamta, Senior Research Fellow, G.B. Pant University of Agriculture and Technology, Pantnagar***

“*I would like to put forth my special thanks to Pantnagar University and DST-TEC team of Pantnagar for launching such an amazing, need-based course. Being the only relevant, budget friendly course available for students, scholars and academicians of agriculture on such a significant topic, this three months course on Data Science and Agriculture is a must for all.”*

***-Ms. Upasana Rana, Assistant Professor, Uttaranchal University, Dehradun***

# REFELCTIONS FROM THE SECOND BATCH OF PARTICIPANTS

*“The course content and teaching methods were highly accessible and facilitated comprehension. Despite possessing limited prior exposure to coding as an agriculture graduate, this course effectively established a foundational understanding. The newly acquired analytical techniques have considerably streamlined the process of data interpretation. Consequently,I would highly recommend this course for agricultural professionals seeking to develop coding proficiency, even with minimal prior experience.”*

***- Mr. Logesh M., PhD Scholar, Indian Institute of Technology, Roorkee***

*“This Data Science and Agriculture course provided a substantial educational experience for the individuals new to coding. Both the Instructors effectively facilitated the learning process for beginners.”*

***- Dr. Harshitha S. B.,Young professional-II, ICAR- IIHR, Bengaluru***

*”The participants found the course to be a valuable educational opportunity. The instructors presented the programming content with such thoroughness that individuals lacking prior computer expertise could readily comprehend and master Python.”*

***- Dr. S. R. Mythili, Senior Research Fellow, Tamilnadu Agricultural University, Coimbatore***

*“The course proved to be highly advantageous. The curriculum was well-organized, and I acquired significant knowledge and coding skills that will be beneficial for my academic and professional development.”*

***-Dr. Amar Nath, Assistant Professor, SLIET Longowal***

*“The course provided a comprehensive understanding of data and its attributes, which will inform subsequent analytical decisions. This analysis will facilitate the interpretation of results, the exploration of relationships, and the formulation of conclusions.”*

***- Mr. Basu Anand, PhD Scholar, Navsari Agricultural University, Gujarat***

*“This course provided a remarkably positive educational experience, and I would like to express my sincere appreciation to the esteemed staff for facilitating this learning opportunity in data science for agriculture.”*

**-Mr. Ojefkhan I. Pathan, Working Professional, Amnex Infotechnologies Pvt. Ltd, Ahmedabad**

*“The course was exceptionally well-structured, facilitating significant learning in several key areas. Specifically, I gained substantial knowledge regarding data analysis techniques, the effective presentation of intricate data through simplified visual representations for enhanced comprehension, and the broader scope and potential applications of data science.”*

**-Dr. Sushil Kumar, Quality Control Inspector, Department of Agriculture and Farmers Welfare, Haryana**

# REFELCTIONS FROM THE THIRD BATCH OF PARTICIPANTS

*“The instruction provided by the Data Science experts was exemplary, characterized by profound subject matter expertise and clarity. I am highly interested in participating in similar future programs and would value continued guidance from these specialists. Furthermore, I strongly recommend the inclusion of advanced-level courses to facilitate deeper technical progression and build upon the excellent foundational knowledge already shared.”*

***- Mr. M. Srinivas Rao, Manager-Quality,Ganga Kaveri Seed Pvt. Ltd., Hyderabad***

*“This course is truly exceptional and worth every penny. The high-quality content provides immense value, making the investment completely justifiable. I found the material to be highly engaging and practical, offering a rewarding learning experience that I highly recommend.”*

***- Ms. Shivani Gupta ,Research Scholar, CSIR - National Botanical Research Institute, Uttar Pradesh***

*”This course is excellent, featuring high-quality content and an impressive delivery style. The teaching methods are effective and engaging, ensuring a solid grasp of the subject. I found the curriculum very beneficial and would highly recommend it to others.”*

***- Ms. Neha Tolia, Project Officer, Himmotthan Society, Uttarakhand***

*“This comprehensive course covers all the essential topics in data science, providing a fantastic learning foundation. The guest lectures were a highlight, offering valuable real-world insights into different aspects of the field. It’s a brilliant program for anyone looking to master the core concepts and advance their career.”*

***-Dr. Vidya Arora, Research Scholar, GBPUAT Pantnagar, Uttarakhand***

*“This course is very good and provides a high level of educational value. The curriculum is well-structured and highly engaging, ensuring that students gain a deep understanding of the subject matter. It is a rewarding experience that effectively enhances one's skills, making it a great choice for any dedicated learner.”*

***- Dr. Partha Sarathi Swain, Assistant Professor, OUAT Bhubaneswar, Odisha***

*“This course is highly informative and exceptionally well-planned. Each session is skill-oriented, offering practical value for professional growth. The curriculum provides a comprehensive learning experience that is both engaging and incredibly beneficial for students.”*

**-Dr Y.Prabhabati Devi, Sr. Scientist and Head, KVK, Imphal East, CAU, Imphal**

*“This course is incredibly helpful for beginners, providing a solid foundation in the field. The guest speakers were exceptionally knowledgeable, sharing valuable expertise. Overall, it is a fantastic program for anyone trying to expertize in fundamentals of data science and machine learning.”*

**-Ms. Ipshita Singh, B.Tech. CSE Student, Shri Ramswaroop Memorial University, Uttar Pradesh**

## ABOUT PANTNAGAR AND DST-TEC

G.B Pant University of Agriculture and Technology, Pantnagar is the first agricultural university of the country established on the Land Grant Pattern in the year 1960. The University is eulogized as 'Harbinger of Green Revolution' by Nobel Laureate Dr. Norman E. Borlaug for its immense contribution in making India self-sufficient in food grain production. Since inception, the University has produced excellent graduates and has an alumni strength of 50,000+ who are in leading positions in agriculture sectors across the country and the world. The University has been placed in World QS Rankings by Subject, consecutively for last four years (2022, 2023, 2024, 2025). To improve the quality of teaching, research and extension in agriculture and allied fields, the University makes utmost efforts through its 350 plus scientists working in 60 departments, and 4000 plus students.

The DST- Technology Enabling Centre (TEC) established at G.B. Pant University of Agriculture and Technology, Pantnagar is the first TEC awarded to a State Agricultural University and is also the first TEC in Uttarakhand. The TEC is working towards creating an ecosystem for assessment of technologies/ prototypes/ products developed within the university and within Uttarakhand, ultimately to enhance the prospect of commercialization. This 3 Months Online Certificate Course in Data Science and Agriculture is another unique effort in this direction.

## REGISTRATION LINK AND PAYMENT DETAILS

**Registration Fees: 5000/- (Rupees Five thousand only)** The Registration Fee is to be deposited in the following account and the screenshot is to be updated in the Registration Form.

Account Number: 10773372306
Account Name: Agriculture College Revolving Fund
Bank name: State Bank of India, Pantnagar
IFSC Code: SBIN0001133

**FOR REGISTRATION**

**C L I C K H E R E**
**https://forms.gle/eTtcRPVFmmZyHHen7**

**OR**

**SCAN THIS QR**

## IMPORTANT DATES

- **Last Date for Registration :** July 15, 2026
- **Course Duration :** July 20, 2026 - October 20, 2026

For any queries, please contact :

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