



Ministry of Education Scheme on
Global Initiative on Academic Network

“Exploring Scalable Data Analysis and Cutting-Edge Graph Mining”

December 22-26, 2025

To be conducted in **HYBRID** mode at NIT Jalandhar

Organized by
Department of Computer Science and Engineering



Dr B R Ambedkar
National Institute of Technology Jalandhar
Punjab, INDIA-144008

www.nitj.ac.in

About NIT Jalandhar

Dr. B R Ambedkar National Institute of Technology Jalandhar is established by Ministry of Education (Formerly MHRD), Government of India. The institute came into existence in the year 1988 (earlier Regional Engineering College Jalandhar) and obtained the status “Institute of National Importance” by Act of Parliament 2007. The institute is offering B. Tech programs in various disciplines like Computer Science and Engineering, Electronics and Communication Engineering, Industrial & Production Engineering, Instrumentation and Control Engineering, Mechanical Engineering, Civil Engineering, Textile Technology, Biotechnology, Chemical Engineering, and Electrical Engineering etc. In addition to B Tech programs, the institute offers M Sc. programs in Physics, Chemistry and Mathematics, M Tech and PhD programs in all Engineering departments. The institute is located on G.T Road Amritsar bypass at a distance of 15 km from Jalandhar Bus Stand, 12 km from Jalandhar City Railway Station, and 18 km from Jalandhar Cantt. Railway Station. It is connected to New Delhi by Road through AC bus service and Rail through Shatabdi/Superfast trains. The city is surrounded by the famous rivers Sutlej and Beas. Jalandhar is internationally famous for the sports goods industry and hand tools industry.

About The Department

The Department of Computer Science & Engineering was founded in 1987 as part of REC Jalandhar. It officially became a separate department in 1990. Since then, it has built a strong reputation with a rich history and has made significant contributions to both the profession and the community. In terms of academic and research achievements the department boasts over 3000 publications in reputed Q1, Q2, and Q3 journals. It has also made significant breakthroughs in innovation and intellectual property with 27 patents filed. The department takes pride in its exceptional placement record, with more than 95% of students placed in leading organizations, and the highest package reaching an impressive 52.11 LPA which reflects the high caliber of its graduates.

Who Can Attend

- This program includes Executives, Engineers, and Researchers from Manufacturing, Service, and Government organizations including R&D laboratories.
- Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic Institutions and technical Institutions.

The participation fee for taking the course would be:

Students	: INR 500 + 18% GST
Academic institutions	: INR 1000 + 18% GST
Industry/Research	: INR 1500 + 18% GST
Participants from abroad	: USD 100

The above fee includes all the instructional materials and refreshments. The boarding and lodging will be provided on a payment basis subject to availability.

How To Register?

Register online at:

Sign up using the following link
https://www.nitj.ac.in/events_registration/gian_esdac_2025/login



Accommodation: The participants will be provided with boarding and lodging on a payment basis. We will share google forms with selected participants. In view of the limited availability of rooms, accommodation will be provided on a first come first serve basis. Participants will not be entitled to payment of any TA/DA.

Course Instructor



Prof Sharma Chakravarthy
Department of Computer Science
University of Texas, Arlington, Texas

Prof. Sharma Chakravarthy has been a professor in the Department of Computer Science at the University of Texas since January 2000. He is an ACM Distinguished Scientist and also an IEEE Senior Member. He spent the summers of 2013, 2014, and 2017 at the Rome Air Force Research Laboratory (AFRL-Rome) working on continuous query processing over fault-tolerant networks and applying stream processing framework to video stream analysis. He established the Information Technology Laboratory (IT Lab) at UT Arlington in Jan 2000. Sharma Chakravarthy has also established the NSF funded, Distributed and Parallel Computing Cluster at UT Arlington. He is well known for his work on stream data processing, semantic query optimization, multiple query optimization, active databases (HiPAC project at CCA and Sentinel project at the University of Florida, Gainesville), and more recently scalability issues in graph mining, social network analysis, and graph analysis of multilayered networks.

For more information

Contact:

Dr. Urvashi

urvashi.nitj.ac.in

Dr. Rajneesh Rani

ranir@nitj.ac.in

Course Coordinators



Dr Urvashi
Assistant Professor
Department of Computer Science & Engineering
Dr B R Ambedkar NIT Jalandhar

Dr. Urvashi is an Assistant Professor in the Department of Computer Science and Engineering at Dr. B.R. Ambedkar National Institute of Technology, Jalandhar. She is a member of various societies like IEEE, ACM, CSI and International Association of Engineers. Her current research interests span various areas including cyber security, information security, Explainable AI, Adversarial learning and water quality assessment. She is an accomplished researcher, with copyrights and patents to her credit. Her research projects have been supported by funding agencies like DST, securing grants exceeding 80 Lakhs. With over 10 years of experience in teaching and research, she actively engages in real-time systems and projects.



Dr Rajneesh Rani
Associate Professor
Department of Computer Science & Engineering
Dr B R Ambedkar NIT Jalandhar

Dr. Rajneesh Rani is an Associate Professor in the Department of Computer Science and Engineering at Dr. B.R. Ambedkar National Institute of Technology, Jalandhar. She is a member of various societies like IEEE, ACM, and ISTE. Her current research interests span various areas, including Digital Image Processing, Computer Vision, Natural Language Processing, and Machine/Deep Learning. She has published more than 70 research papers and articles in Journals, Conferences, and Magazines of repute. She has handled research projects of more than 50 lacs rupees sponsored by International and National funding agencies. Currently, she has acted as a Co-Investigator of ISRO Funded research project on “Single Object Detection in Video/Image Sequence”.

Important Dates

Course Dates:

December 22-26, 2025 (5 days)

Last Date of online Registration:
November 15, 2025

Course Overview

Data Science and Data Analytics have become a critical and integral umbrella component of what used to be data management, data storage, querying, analysis, report generation, and mining/machine learning. This has become indispensable for any organization or agency that has data collected from various sources including IoT and images/video. In the modern digital landscape, the rapid growth of data has necessitated the development of scalable techniques to analyze and extract insights from vast datasets. As the volume, velocity, and variety of data continue to expand, traditional methods of analysis prove inadequate. Scalable approaches involve employing advanced techniques, algorithms, and technologies to handle massive datasets without compromising on performance or accuracy. This will enable organizations to extract valuable information from Data Mountains, paving the way for informed decision-making and innovation. Cutting-edge graph mining involves the application of advanced techniques to analyze intricate relationships within complex networks or graphs. Cutting-edge techniques employ algorithms that reverse these structures to uncover patterns, clusters, influential nodes, and insights, enabling a deeper understanding of interconnected data. This course will serve as a comprehensive guide, unraveling the intricacies of scalable data analysis while delving into the forefront of graph mining innovations. From social networks to multimedia databases, this course will provide the realms of cutting-edge research and practical application. "Exploring Scalable Data Analysis and Cutting-Edge Graph Mining" isn't merely a course; it's a transformative journey. It will empower participants to command vast datasets with precision, unravel the complexities of interconnected networks, and extract insights that illuminate pathways to innovation. With a blend of theory, application, and ethical awareness, this course will be an indispensable resource for anyone seeking to thrive in the dynamic landscape of data driven decision-making.

Objectives

The primary objectives of the course are as follows:

- To comprehend the limitations of traditional methods in managing large datasets and to uncover how innovative approaches can effectively process and derive valuable insights from extensive data streams.
- To acquire a strong foundation in graph mining, the significance of interconnected relationships within complex data networks.
- To explore how cutting-edge graph mining techniques unveil hidden patterns, clusters, and influential nodes within interconnected networks. Learn to extract valuable insights that can drive informed decision-making, process optimization, and innovative solutions across various industries.
- To bridge the gap between theory and practice by engaging in hands-on projects that simulate real-world challenges. Implement algorithms, models, and techniques on actual datasets, translating theoretical knowledge into practical solutions.
- To equip the participants with practical skills that are directly applicable to today's data driven world as a beginner or an experienced data professional.
- To equip the participants to tackle the challenges of tomorrow's data landscape. Whether it's processing ever-expanding datasets or deciphering intricate network relationships, the participants will be prepared to face these challenges head-on and contribute effectively to data-driven endeavors.

Course Contents

Lecture 01: Understanding the need for scalable techniques in the era of big data.

Lecture 02: Exploring the differences between traditional mining and graph mining/analysis in complex networks and their significance.

Lecture 03: Exploring graph theory basics: nodes, edges, and types of graphs (simple, attributed, and multilayer networks).

Lecture 04: Understanding centrality measures, need for community and its detection, and other key graph concepts.

Lecture 05: Delving into advanced graph algorithms: PageRank, HITS, substructure discovery, and more.

Lecture 06: Identifying patterns, clusters, and influential nodes within complex networks

Tutorial 01: Case study: Applying advanced techniques to real world network data.

Lecture 07: Addressing ethical considerations in handling large-scale data.

Lecture 08: Ensuring privacy, security, and responsible use of data.

Tutorial 02: Case study: Uncovering hidden insights in social media interactions.

Lecture 09: Exploring emerging trends in data analysis and graph mining.

Lecture 10: Graph-based machine learning, deep learning on graphs, and more.

Tutorial 03: Integrating concepts learned throughout the course into a comprehensive project. Analyzing a real-world dataset using scalable techniques and graph mining.