

About Institute

Guru Nanak Dev Engineering College (GNDEC), Ludhiana, established in 1956, is one of the oldest and a premier Engineering Institute of India. The Institute is set up on 88 acres of sprawling pristine land along Gill Road (Ludhiana-Malerkotla Highway). The foundation stone of the college was laid by Honorable Dr. Rajendra Prasad Ji, President of India on April 8, 1956. GNDEC is now an autonomous college under UGC Act 1956 [2(f) and 12(B)] and also accredited by NAAC with 'A' grade. The Institution has six Under-Graduate (UG) programmes, thirteen Post-Graduate (PG) programmes, besides being a QIP Centre for Ph.D.

About Department

Computer Science and Engineering Department was established in 1997. Department is currently offering undergraduate and postgraduate programmes with an intake of 300 and 12 respectively. Ph.D. programme is also being offered in the department. The department has various laboratories equipped with state-of-the-art computing facilities to support the research and teaching activities. The research activities in the department involve fields like Natural Language Processing, Image Processing, Big Data, Cloud Computing, Software Engineering, Network Security, etc.

Objective

R is a powerful tool for statistical computing and data visualization, which are critical in engineering fields like Computer science, Information Technology, Civil, Mechanical, Electrical, Environmental, and Industrial Engineering. R Lab training teaches students how to analyze large datasets, Perform statistical tests, Identify trends and patterns. R is widely used in Bioengineering, Environmental modeling, Smart Grid Analysis, and IoT applications. Engineers who know R can collaborate more effectively with data scientists and other domain experts. Students who know R can better handle final year projects, internships, and academic research involving data collection and analysis.

Who can apply?

It is an Interdisciplinary training. So the students of B.Tech (**CSE/IT/ME/Civil/EE/ECE**) – from both 2nd Year and 3rd Year as well as from BCA and MCA can apply for this training programme. Students from other Engineering / Polytechnic colleges can also join this training.

Four Weeks Summer Training Program

On

Interdisciplinary Training on Data Analytics using R

Tentative (3rd week of June – 3rd week of July 2025)



Dr. Kiran Jyoti
(Head, Department of CSE)

Dr. Amit Jain
(Training Coordinator)

Organized by:

Testing and Consultancy Cell

in collaboration with

Department of Computer Science and Engineering
Guru Nanak Dev Engineering College, Ludhiana, Punjab – 141006

[An Autonomous College u/s 2(f) and 12(B) of UGC Act. 1956]

Interdisciplinary Training on Data Analytics using R

Duration: 4 Weeks

Mode: Offline

Contents to be covered

Week 1: Introduction to R Language & Basic Data Handling

Getting Started with R, Installing R and RStudio, R syntax: variables, data types, operators (vectors, matrices, data frames), Basic functions and help documentation, Data Structures & Data Import, Vectors, matrices, lists, data frames, and tibbles, Reading/writing CSV, Excel, and text files, Data exploration, Data Cleaning Basics, Handling missing, Filtering, selecting, renaming columns, Type conversions and string handling.

Week 2: Data Manipulation and Visualization

Data Wrangling with dplyr & tidyr, Filtering, Selecting, and mutating, Grouping and summarizing, Reshaping data using pivot_longer(), pivot_wider(), Data Visualization with ggplot2, Grammar of graphics, Creating bar, line, Histograms, boxplots, scatter plots, Combining plots using patchwork or cowplot, Overlaying time-series for machine monitoring or load cycles, Faceted plots for multiple test specimens.

Week 3: Statistical Analysis and Modeling in Engineering Domains

Exploratory Data Analysis (EDA), Descriptive statistics, Correlation and hypothesis testing, Linear Models and ANOVA, Interpreting outputs, Model diagnostics, Linear and multiple regression for stress-strain and flow rate modeling, Polynomial regression for non-linear trends, Curve fitting in mechanical systems (e.g., fatigue analysis), Domain Specific packages like Social sciences, Environmental science, Bioinformatics, Economics.

Week 4: Advanced Topics and Interdisciplinary Applications

Spatial & Geotechnical Data in Civil Engineering, Mapping with sf or leaflet, Geotechnical borehole data visualization, Case: Soil type mapping and interpolation, Mechanical Testing and Simulation Data, Importing simulation output (FEA/CFD) for post-processing, Statistical summary of output variables, Visualization of results in 2D/3D using rgl or plotly, Reproducible Research, Using R Markdown, Creating dynamic reports, Version control basics with Git.

- Daily Quiz
- Hands on Practice on daily tasks
- Weekly Assignment – with Practical Problems
- **Project Submission – Within One Week after completion of the course.**

Registration Form

Name (in block letters): _____

University Roll Number: _____

College Roll Number: _____

Department: _____

Institution: _____

Mailing Address: _____

Age: _____ Gender (M/F): _____

Mobile No.: _____

Email: _____

Registration Fee: Rs. 4500/- (Including GST)

Receipt No. (Cash Payment): _____ Date: _____

Signature of Applicant: _____

Note:

The participants should send through e-mail the scanned copy of the filled and duly signed registration form to the training coordinator on or before **30th May, 2025**. The hard copy of the registration form must be submitted on the first day of the program at the registration desk.

Contact Detail:

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