Five Day Workshop

on

Geospatial Data Analysis and Handling using MATLAB

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Coordinator
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Call for participation

Organized by

Centre of Excellence on
"Water Resources and Flood Management",
Department of Civil Engineering
Sardar Vallabhbhai National Institute of Technology, Surat-395007, Gujarat, India

About the Institute

The institute was initially established as Sardar Vallabhbhai Regional College of Engineering & Technology in 1961 and was upgraded as National Institute of Technology (SVNIT) in 2002. The SVNIT, at present, is one of the prestigious engineering institutions of the country and has contributed many outstanding engineers in India and abroad. At present, the Institute runs Undergraduate, and Postgraduate programmes, three MSc integrated programmes, MBA programme and Ph.D. programmes in all disciplines of Engineering and Applied Sciences. Special attention is being given in developing the culture of interdisciplinary and collaborative research. The institute has an excellent placement record with a number of top-ranking companies visiting the campus every year.

About the Department

The Department of Civil Engineering came into existence in the year 1961. The department has been running one UG programme in Civil Engineering, seven PG programmes (Water Resources Engineering, Environmental Engineering, Structural Engineering, Construction Technology and Management, Geotechnical Engineering, Urban Planning, and Transportation Engineering & Planning) and the research programmes leading to Ph.D. degree in different areas of specializations.

About Centre of Excellence

The Water Resources Engineering section of the department had full-fledged facilities for UG/PG and PhD programmes. The section has taken lead to establish Centre of Excellence (CoE) on 'Water Resources and Flood Management being funded from World Bank under TEQIP-II. The CoE aims to develop excellent computational and experimental facilities in the area of Hydraulics and Water Resources; develop Early Warning System for flooding in Surat city; and organize short term training programmes on thematic areas to the academicians and practitioners in the field.

Workshop Objectives:

The topics of deliberations in the workshop is as follows:

1) **MATLAB is a widely used language for scientific computations. This course aims to familiarize students with MATLAB programming and illustrate its application in scientific computations.**
2) **Through a series of coding examples and problems, the course delves into the fundamentals of geoscience data processing techniques, offering practical insights into the use of MATLAB.**
3) **The primary objective is to acquaint learners with computational methods using MATLAB.**

Workshop / Course Content

Module I: Getting Started with MATLAB

▪ **Day 1**: Introduction to MathWork packages, installing MATLAB, online MATLAB, getting familiar with Command Window, script editor, variable space, introduction to live scripting, variable assignment, array defining, matrix operations, slicing matrix and element access, 'for' and 'while' loop creation, defining conditional statement.

▪ **Day 2**: Start writing your own script and functions for example problems, exploring MATLAB inbuilt utility functions, import and export different types of data into and from MATLAB, saving data in 'mat' file, building the compatible codes for automation of large data downloads.

Module II: MATLAB Plots for Geoscientific Visualization

▪ **Day 3**: Plot line, bar, pie, scatter, histogram, error-bar, area, box plot, swamp plot, bubble plot; MATLAB graphics handling, setting axis properties, vector data handling and plotting, raster data handling and plotting, colormap and colorbar handling.

Module III: Geostatistical Analysis with MATLAB

▪ **Day 4**: Generating parametric and non-parametric probability density functions and cumulative distribution functions, introduction to one- and two-dimensional interpolation techniques, Regression Analysis –Simple Linear Regression and Multiple Linear Regression, optimization Problems, Introduction to Time Series Analysis – tend and seasonality analysis.

Module IV: Numerical Modelling with MATAB

▪ **Day 5**: Numerical Methods of numerical differentiation and integration, trade-off between truncation and round-off errors, error propagation and in-built MATLAB functions. Linear and polynomial interpolation – 1D and 2D interpolation, Piecewise interpolation (Spline).

Eligibility of Participants

The workshop is open to scientists, academicians, and postgraduate and doctoral scholars (MTech and Ph.D.).

Registration

The workshop is free of cost only on invitation basis. The number of participants for the programme is limited to 30 on first come first serve basis.

Link for the Registration

https://docs.google.com/forms/d/e/1FAIpQLSdGq3wdZF6nSiMUh9KcAWfATAECY0QdX8c2Ju3ddZ6zMUlPIA/viewform?usp=publish-editor

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