



NITIE

National Institute of
Industrial Engineering

Financial Analytics with Time Series Modeling and Neural Networks

Objectives:

This short course aims to discuss a broader aspect of time series modeling on financial data with advanced tools and techniques. It covers applied econometric tools relating to univariate financial time series models and LSTM using Python. The course aims to develop insights of financial models with univariate time series analysis and neural networks models using stock market indices.

Learning Outcomes:

After completion of the course, participants would be able to:

- Understand Time Series and Neural network properties of Financial data
- Theoretical and empirical implications of Financial Time series
- Univariate Time series modelling and forecasting.
- Advanced research in LSTM

Course Content:

- Fundamentals of Financial Time series
- Univariate Time series modelling
- Modelling return volatility
- Understanding Financial Time Series and Neural network



Online mode



15 Hours

Fees :
Rs 7080



Program Code:
122 482

Course Coordinators:

Dr. Ajaya Kumar Panda

Associate Professor
(Accounting and Finance)

Prof. Rakesh Verma

Professor
(Analytics and Decision Science)

Course Content In Details

1. Fundamentals of Financial Time series

- a. Visualization of Time series data
- b. Autocorrelation functions and testing of stationarity of financial data
- c. Moving averages and time series smoothers

2. Univariate Time series modeling

- a. Introduction to ARIMA
- b. Building ARIMA model and forecasting market returns
- c. Modeling using ARIMAX

3. Modeling return volatility

- a. Autoregressive Conditional Heteroskedasticity (ARCH) modeling of market return.
- b. Generalized Autoregressive Conditional Heteroskedasticity (GARCH) modeling of
- market return.

4. Understanding Financial Time Series and Neural network

- a. Understanding Neural network
- b. AI Neural Network in financial Data
- c. Recurrence Neural Network (RNN) and its advantage and disadvantage
- d. Long Short-term Memory Model (LSTM)

Prerequisites

- Personal computer with Python (we will be using Google Collab.)
- Basic knowledge of statistics and time series expected.
- Basic understanding of Python is expected to install packages/library.
- However, the course is design in such a way that participants with little knowledge in statistics and zero knowledge in computer language like Python can easily manage to learn financial time series modelling in this course.