

MANGALORE UNIVERSITY
Department of Statistics
MSc Statistics

Soft Core	STS554 : Financial Time Series	No. of credits: 3
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Course Outcomes:

- CO1: The ability to approach and analyse financial time series
- CO2: The ability to differentiate between various financial time series models.
- CO3: The ability to perform cross-validation of the model developed.
- CO4: The ability to forecast future observations of the market.
- CO5: A running knowledge of R for applied time series analysis

Unit 1: Financial time series and their characteristics: Assets and Markets, Asset Returns, Distribution of returns, empirical properties of returns, Market Indexes. [9 hrs]

Unit 2: Stationary process. Autocorrelation function, Simple Autoregressive, Moving Average, Autoregressive moving average (ARMA) and seasonal ARIMA models.

Unit root non-stationarity, Testing for unit roots, Dickey-Fuller Tests, and its extension. Co-integration and error correction models. [12 hrs]

Unit 3: Conditional Heteroscedastic models: Volatility, Characteristic of volatility, model building. The Autoregressive Conditional Heteroscedastic (ARCH) model. Properties of ARCH model. Order determination, estimation and forecasting. [10 hrs]

Unit 4: The GARCH model and properties. Estimation and forecasting. Elementary properties of EGARCH and M-GARCH models.. [06 hrs]

References:

1. Rucy S. Tsay (2009): *Analysis of Financial Time Series*, 2nd Ed. Wiley Series in Probability and Statistics, ISBN 978-81-265-2369-6.
2. Christian Gouriéroux G and Joann Jasiak (2005): *Financial Econometrics*, New Age publications, ISBN 81-224-1697-7.
3. Dilip M. Nachane (2006) *ECONOMETRICS, Theoretical Foundations and Empirical Perspectives*, ISBN-10-0-19-564790-4, Oxford University Press, New Delhi.
4. David Ruppert (2004) "Statistics and Finance an Introduction" – Springer International Edition.