# 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 Gourieroux 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.