Course code	Course Title	L	T	P	C
BCSE336P	Financial Data Analytics Lab	0	0	2	1
Pre-requisite	NIL	Syllabus version			
		1.0			

Course Objectives

1. Learn how to model financial time series using liner ARMA type time series.
2. Study how to test and model heteroscedastic effects using ARCH / GARCH type time series.
3. Acquire how to test for unit root and construct ARMA models.

Course Outcome

At the end of the course, the student will be able to

1. Approach and analyze any financial data.
2. Differentiate between various time series models.
3. Perform cross-validation of various financial models developed.
4. Forecast future observations on financial data.

Indicative Experiments		
1.	Given a simple daily return of a concern as data, implement and execute a R program to compute the sample mean, standard deviation, skewness, excess kurtosis, minimum and maximum of each simple return series.	**8 hours**
2.	Consider the daily range (daily high–daily low) of Apple stock from January 2, 2007 to December 23, 2011. One can obtain the data by the package quantmod from Yahoo. Compute the first 100 lags of ACF of the series. Is there evidence of long-range dependence? Why? If the range series has long memory, build an ARMA model for the data.	**8 hours**
3.	Consider the 30-year conventional mortgage rates from April 1971 to November 2011. Build a pure time series model for the monthly mortgage rate. Perform model checking and find the fitted model.	**8 hours**
4.	Use the quantmod package to obtain the daily prices of Apple stock from January 2, 2007, to November 30, 2011. Use an ARMA–GARCH model to obtain the daily volatility of the stock. Compare the three volatility series.	**6 hours**
	Total Laboratory Hours	**30 hours**

Mode of assessment: Continuous assessment / FAT / Oral examination and others

Recommended by Board of Studies	12-05-2022		
Approved by Academic Council	No. 66	Date	16-06-2022