STA 3180 Statistical Modelling: Time Series

Topic: Time Series

I. Introduction to Time Series

A. Definition of Time Series

B. Components of Time Series

C. Types of Time Series

II. Autocorrelation and Stationarity

A. Autocorrelation Function

B. Stationarity

III. ARIMA Models

A. Autoregressive (AR) Models

B. Moving Average (MA) Models

C. Autoregressive Moving Average (ARMA) Models

D. Autoregressive Integrated Moving Average (ARIMA) Models

IV. Forecasting

A. Estimation of Parameters

B. Model Selection

C. Forecasting

Problem Solving Strategies:

1. Understand the components of a time series and be able to identify them.

2. Be familiar with the different types of time series and their characteristics.

3. Understand the concept of autocorrelation and stationarity and be able to calculate the autocorrelation function.

4. Be able to identify the appropriate ARIMA model for a given time series.

5. Understand the estimation of parameters and model selection process.

6. Be able to use the appropriate forecasting techniques for a given time series.

7. Practice problem solving by working through example problems.