STATISTICS 3540
TIME SERIES I

Data collected through time are often related among themselves. For example, the volume of sales of a company in one month is probably related to that in another month, January sales to December sales, for instance. Time series techniques are statistical techniques for handling data that are dependent over time. In this course, statistical models that incorporate dependency on data, techniques for analyzing the model and making use of the model for forecasting and prediction will be covered. Data or series which display stationary or non-stationary or seasonal behavior will also be considered in this course.

Text. *Time Series Analysis with Applications in R* by J. Cryer and Kung-Sik Chen.

Marks. The marks are usually split 50% for term work and 50% for the final exam.

Calendar description. **3540 Time Series I** is an introduction to basic concepts of time series analysis such as stationarity and nonstationarity, components of time series, transformation of nonstationary series using regression, decomposition methods and differencing, autocovariance and autocorrelation functions, moving average (MA), autoregressive (AR), and ARMA representation of stationary time series including stationarity and invertibility conditions; partial autocorrelation function; properties of MA(q), AR(p) and ARMA(p, q) models, model identification, parameter estimation, model diagnostics and selection, forecasting, integrated ARMA process. Applications to real time series.
Prerequisites: Either Statistics 3411 or both Mathematics 1001 and one of Statistics 2501 or 2560 or the former 2511.

Offered: *Contact the Deputy Head (Statistics) in the Department of Mathematics and Statistics for information regarding the scheduling of this course.*