

## **STAT 443 Time Series and Forecasting ; Winter 2026 (January to April)**

### **Course syllabus**

**UBC On-line calendar description:** Trend and seasonality, autocorrelation, stationarity, stochastic models, exponential smoothing, Holt-Winters methods, Box-Jenkins approach, frequency domain analysis.

**Prerequisites:** Introductory probability, introductory statistics; **Corequisite:** Stat 305 (Introduction to Statistical Inference); **Recommended:** Stat 306 or Stat 300 or Econ 326 (Multiple Regression applications with/without linear algebra).

#### **References.**

1. Forecasting: Principles & Practice, 2nd edition, by Hyndman and Athanasopoulos; online version at <https://otexts.com/fpp2/> ; <https://otexts.com/fpp2>
2. Reproducible Code, published by British Ecological Society.  
<https://www.britishecologicalsociety.org/wp-content/uploads/2019/06/BES-Guide-Reproducible-Code-2019.pdf>

#### **Main topics:**

Visualization, trends, exploratory techniques, autocorrelation  
Forecasting and prediction, assessment of prediction accuracy  
Exponential smoothing and Holt-Winters methods  
Autoregressive, moving average, ARIMA, ARMAX  
Other topics if time permits

#### **Statistical software:**

R : [www.r-project.org](http://www.r-project.org) or [cran.stat.sfu.ca](http://cran.stat.sfu.ca)

**Homework:** Regular homework and lab exercises.

**Team project:** Submission of project proposal in early February, and written project report due near end of term. Team size should be about 4.

**Course Evaluation:** midterm exam, final exam, homework, project.