Syllabus

This course is to provide a general and comprehensive introduction to the theory and practice of time series analysis. Students will have a unique opportunity to learn the course material through hands-on practices on real world data such as corporate revenue and monthly product demand. The instructor, Dr. Jerry Shan, has successfully been leading efforts in developing financial prediction algorithms for the Hewlett-Packard Company. Topics include the following.

- Introduction
- Descriptive techniques
- Models for time series
- Estimation in time domain
- Forecasting in time domain
- Stationary Processes in the Frequent Domain
- Spectral Analysis
- Bivariate Processes with Frequent Analysis
- Linear Systems
- Bayesian Modeling and Forecasting
- Interval Predictions
- Holt-Winters Modeling and Forecasting
- State-space Modeling and Kalman Filtering
- Neural Network, GARCH and Other Methods