STATISTICS 505
"TIME SERIES ANALYSIS"

Calendar Description: H(3-1T)
   Trend fitting, auto-regressive schemes, moving average models, periodograms, second-order stationary processes, ARCH models, statistical software for time series. Additional topics may include Bayesian analysis, spectral theory, Kalman filtering.
Prerequisite: Statistics 429 or consent of the Division.

Suggested Text: "*Time Series Analysis", Box,3rd Edition, Jenkins and Reinsel*,
      "*The Analysis of Time Series", 6th Edition. Chatfield.*

Syllabus

Topics	Hours
<u>Multivariate Normal Distribution</u>: moment generating functions, covariances, independence, correlation	3
<u>Spectral Decomposition of Covariance</u>: Bochner's Theorem.	3
<u>Spectral Decomposition of Time Series:</u> Proof using Hilbert Spaces, properties of the spectral measure.	9
<u>Estimation of the Spectral Distribution:</u> Periodograms	3
<u>Moving Average processes:</u> Hilbert space proof that all time series can be represented as a moving average process.	3
<u>Linear Filters: Input output.</u> Computation of the spectral density of the output in terms of the spectral density of the input.	3
<u>AR(p), MA(q) and ARMA(p,q) Processes:</u>	9
<u>Prediction:</u>	3
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