Course Specifications

General Information

Course name	Time Series Analysis
Course number	STAT4321
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Time series refer to any collection of measurements taken at different points in time. The objective of this course is to present you with the mathematical and statistical tools to analyze such data. We will cover temporal, Fourier and Wavelet analysis, and its applications to modern statistical signal processing and machine learning.

Intended Learning Outcomes

Knowledge and Understanding

* state the basic theory of time series analysis and forecasting approaches
* synthesize the relevant statistical knowledge and techniques for forecasting
* identify, define and formulate forecasting problem, and use procedures in popular statistical software for the analysis of time series and forecasting
* interpret analysis results and make recommendations for the choice of forecasting methods
* produce and evaluate forecasts for given time series
* present analysis results of forecasting problems

Course Contents

1 - Introduction
2 - ExamplesofTimeSeries
3 - ObjectivesofTimeSeriesAnalysis
4 - SomeSimpleTimeSeriesModels
5 - Stationary Processes
6 - TheAutocorrelation Function
7 - The Partial Autocorrelation Function
8 - ARMA(p,q) Processes
9 - The ACF and PACF of an ARMA(p,q) Process
10 - Forecasting ARMA Processes
11 - Nonstationary and Seasonal Time Series Models

Teaching and Learning Methods

1 - Lectures
2 - applications

Students Assessment

Assessment Method	TIME	MARKS
midterm	1 hour	40 %
final exam	2 hours	50 %
homework		10 %

Books and References

Essential books	مقدمة في التحليل الحديث للسلاسل الزمنية ، سمير شعراوي ، 2005
Recommended books	Tsay, R.S. ,Analysis of Time Series 3rd edition, 2010