Extended syllabus

Course Title	Time Series Data Analysis and Forecasting	Course Number	MGT4206
Credit	Theory (3.0)	Eligible Student	
Class time	Tue/ Thu 12:00~13:15 pm	Venue	

Professor's Picture	Name: Kim, Myung Suk	Homepage:
	Office hour/place: MA709	

Ⅰ. Course Description

1. Description

This course is an introduction to the use and limitation of mathematical and statistical techniques in management contexts. Several statistical techniques are covered and examined for application in quantitative decision-making. The main purpose of the course is to provide useful information and methodology for the actual statistical data analysis. There are two aspects to meeting these goals. Homework materials or class projects will include practical examples with tremendous savings in many areas.

2. Prior learning contents

Business Statistics (You do not need any rigorous statistical analysis background)
You will learn and review from basic statistics in the class.

3. Course Format(%)

Lecture	Discussion	Experiment/Practice	Field study	individual/T	Others/ Extra
70%	30%	%	%	%	%

4. Evaluation(%)

mid-term exam	final team project	Quiz	Presentation	mid-project	Assignments	Participation	Others/ Extra
15%	30%	%	%	15%	30%	10%	%

Ⅱ. Course Purpose

Knowledge: The education of the following statistical techniques: (a) Multiple Regression Model (2) Decomposition Model (Trend, Seasonality), (3) Auto Regressive Integrated Moving Average (ARIMA) Model, (4) ARMA with exogeneous variable (ARMAX) model, (5) Spectral Analysis, (6) Generalized Additive Model (GAM)

Skill: You will learn how statistical techniques above are actually used in practice. Homework materials or class projects will include practical examples with tremendous savings in many areas.

Attitude: The course covers globalization through various international case studies to resolve problems. Also the course emphasizes ethical standards to protect professional integrity and to minimize ethical breaches. Finally, the course pursues the Excellencies in a view of professional analyst by introducing practical data analysis with statistics computer software as well as statistical theories.

Ⅲ. Course Format

1. To understand and uphold ethical standards for the statistics profession
2. To become familiar with the statistical terminology, basic principles and steps involved in planning and conducting statistical studies.
3. To apply statistical tools to interpret and convert data into useful information necessary to make sound business decisions.
4. To obtain a working knowledge of the following areas of statistics: descriptive statistics, probability and statistical inference.

4~6 Homeworks
Mid-term project: Individual based project (Multiple regression analysis) will be given.
Final project: Team project (Time series data analysis):
presentation (10%) +final report (20%)

Ⅳ. Course Requirements

Ⅴ. Materials and References

1. Class materials and class related announcements will be uploaded at Sogang Cyber Campus before the class (http://cybernet.sogang.ac.kr/).
2. References:
[1] Tsay, R.S. (2005), Analysis of Financial Time Series, Wiley, New Jersey, USA.
[2] Doane, D.P., Seward, L.E. (2007), Applied Statistics in Business and Economics (Ch. 14), McGraw Hill, Boston, USA.
[3] Casella, G., Berger R.L. (1990) Statistical Inference, Duxbury, California, USA.
[4] Cryer, J.D., Chan, K. (2008) Time Series Analysis with Applications in R, Springer, New York, USA.

Ⅵ. Course schedule

Before Mid-term:
1) Review of statistics
2) simple & multiple regression analysis techniques,
3) Introduction of time series data analysis
4) Decomposition model

After Mid-term:
5) Autoregressive model
6) ARIMA model
7) ARMAX model
8) Spectral analysis
9) GAM model

1 week	Learning objective	Review of Statistics
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
2 week	Learning objective	Multiple Regression Model
	Main learning contents	

	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
3 week	Learning objective	Multiple Regression Model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
4 week	Learning objective	Multiple Regression Model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
5 week	Learning objective	Introduction to time series data analysis
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
6 week	Learning objective	Decomposition model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
7 week	Learning objective	Decomposition model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	

8 week	Learning objective	Take-home exam
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
9 week	Learning objective	AR model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
10 week	Learning objective	ARMA model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
11 week	Learning objective	ARMA model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
12 week	Learning objective	ARMAX model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
13 week	Learning objective	Spectral analysis

	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
14 week	Learning objective	Nonparametric additive model
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
15 week	Learning objective	Final presentation
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	
16 week	Learning objective	Final-project hand-in
	Main learning contents	
	Teaching method and materials	Lecture and discussion/ see materials and references above
	preparation must be done by student	It is important to read the textbook or class materials before the class begins.
	References	

Ⅶ. Course Policy

Attendance Policy:
You are expected to attend class on a regular basis and are responsible for all material discussed in class. Any student with more than three unexcused absences may be dropped from the class. Any necessary absence occurring while a student is representing the BusinessSchoolinsomeofficialwaywillbeconsideredanexcusedabsence.

Homework Policy:

1. You are encouraged to discuss the homework problems with your class mates, but should try to solve them for yourself.
2. If you hand-in your homework without enough explanation to your answers, you will receive only partial scores.
3. You will receive partial scores for the late hand-ins.

Ⅷ. Special Accommodations

Disability related services:
If you have a documented disability that may impact your performance in this class and for which you may require accommodations, you must be registered and provide documentation of your disability to the Assistant for help.