



Sungkyunkwan University (SKKU) International Summer Semester (ISS) 2022

# [Forecasting and Time Series Analysis Utilizing Big Data]

Prof. Heejoon Han, Sungkyunkwan University

## SHORT COURSE DESCRIPTION

---

This course will cover the statistical and econometric techniques needed to conduct quantitative research in macroeconomics or finance, including the estimation of time series models and forecasting of economic indicators or financial markets. This knowledge will enable students to understand and interpret empirical findings in a range of macroeconomics and financial economics. On completing this course the students will understand the central technical issues in the statistical analysis of time series. They will be comfortable with the use of the econometric software R to undertake their own research.

## READING MATERIALS

---

All students are expected to have taken an econometrics course and an introductory statistics course. Instruction will be provided for the econometric program R.

## COURSE REQUIREMENTS AND GRADING

---

There will be problem sets and a final exam. The grading breakdown is as follows:

Assignments:	30%
Data Project (presentation):	10%
Data Project (report and codes):	20%
Final Exam:	30%
Attendance and participation:	10%

## COURSE SCHEDULE

---

### – WEEK I –

<u>Monday (27 June)</u>	Introduction and R basics
<u>Tuesday (28 June)</u>	Linear time series 1
<u>Wednesday (29 June)</u>	Linear time series 2
<u>Thursday (30 June)</u>	Unit root tests and cointegration

### – WEEK II –

<u>Monday (4 July)</u>	Forecasting procedure and evaluation methods 1
------------------------	--

Tuesday (5 July) Forecasting procedure and evaluation methods 2

Wednesday (6 July) VAR (Vector autoregression) 1

Thursday (7 July) VAR (Vector autoregression) 2

**– WEEK III –**

Monday (11 July) ARCH/GARCH type conditional heteroskedasticity 1

Tuesday (12 July) ARCH/GARCH type conditional hetreoskedasticity 2

Wednesday (13 July) ARFIMA and long memory

Thursday (14 July) Variable selection: LASSO

Friday (15 July) Final Exam

**– WEEK IV–**

Monday (18 July) Consultation for data project

Tuesday (19 July) Presentation of data project