

## 國立中山大學 106學年度第2學期 課程教學大綱

|      |                      |     |    |    |           |
|------|----------------------|-----|----|----|-----------|
| 中文名稱 | 時間數列分析               |     |    | 課號 | ECON536   |
| 英文名稱 | TIME SERIES ANALYSIS |     |    |    |           |
| 課程類別 | 講授類                  | 必選修 | 選修 | 系所 | 經濟學研究所碩士班 |
| 授課教師 | 李慶男                  |     |    | 學分 | 3         |

### 課程大綱

This is a course in Macro econometrics. Econometrics is concerned with the systematic study of economic phenomena using observed data. We will mainly concern on the treatment of parametric modeling. (Therefore, there is a field called Nonparametric Econometrics—see Pagan and Ullah, 1999, Nonparametric Econometrics)

To study the econometrics parametrically, we will first discuss regression analysis. The regression analysis put some variables (especially economic variables) to be some function (linear or nonlinear) of other economic variables and verse vise. These constitute the study of multiple regression and simultaneous equations model.

On the other hand, time series analysis of econometrics, we regard the economics variable is coming from some stochastic mechanism of her own past and new innovation (unit variable time series analysis) and even stochastic function of other variables past value and innovation (vector time series analysis). These two views of econometrics is now somewhat merging. (See Granger, 2001, Macro Econometrics – Past and Future, Journal of Econometrics, 100). With this statistical background, I hope you will have the basic skill to read modern therical Journal article.

### 課程目標

Let student be more familiar with Time Series Analysis.  
在修習完本課程後，預期之學習成效包含：

1. 系所專業能力-經濟分析：設定適當之經濟變數以透過經濟模型來分析總體經濟議題。
2. 系所專業能力-專業技術：能瞭解總體實證經濟常用的研究方法以分析且預測總體經濟現象。
3. 系所專業能力-問題解決能力：能尋找有興趣的總體經濟問題，並利用學習之研究方法來尋找答案。
4. 全校學生基本素養與核心能力方面-表達與溝通能力：透過課程討論能流暢使用淺白易懂之語句與他人進行討論。
5. 全校學生基本素養與核心能力方面-探究與批判思考能力：能找出影響總體議題的主要變數且進行分析與預測。

### 授課方式

An oral instruction will be employed within all class

### 評分方式〔評分標準及比例〕等第制單科成績對照表

- 1.作業：30%
- 2.期中考：30%
- 3.期末考：40%

參考書/教科書/閱讀文獻〔請遵守智慧財產權觀念，不可非法影印。教師所提供之教材供學生本人自修學習使用,不得散播及做為商業用途〕

| 序號  | 作者              | 書名                                                        | 出版社                        | 出版年             | 出版地             | ISBN# |
|-----|-----------------|-----------------------------------------------------------|----------------------------|-----------------|-----------------|-------|
| No. | Author          | Title                                                     | Publisher                  | Year of publish | Publisher place | ISBN# |
| 1   | Greene, W. H.   | <i>Econometric Analysis, 4th Edition, (Required)</i>      | Prentice Hall              | 2000            |                 |       |
| 2   | Hamilton, J. D. | <i>Time Series Analysis(Required)</i>                     | Princeton University Press | 1994            |                 |       |
| 3   | White, H.       | <i>Asymptotic Theory For Econometricians(Recommended)</i> | Academic Press.            | 2001            |                 |       |
| 4   | Spanos, A       | <i>Statistical Foundations of econometric Modeling</i>    | Cambridge University press | 1986            |                 |       |

| 每週課程內容及預計進度 |
|-------------|
|-------------|

| 週次   | 日期                    | 授課內容及主題                                                                                                                                                                                                  |
|------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week | Date                  | Content and topic                                                                                                                                                                                        |
| 1    | 2018/02/26~2018/03/04 | Statistical Review: sample space, random variable, parametric probability model, sampling, estimation, hypothesis testing. (Spanos)                                                                      |
| 2    | 2018/03/05~2018/03/11 | Difference equation                                                                                                                                                                                      |
| 3    | 2018/03/12~2018/03/18 | Lag Operators                                                                                                                                                                                            |
| 4    | 2018/03/19~2018/03/25 | Stationary ARMA Model (Hamilton, Ch.3, 5) (i). Population Characteristics (ii). Estimation.                                                                                                              |
| 5    | 2018/03/26~2018/04/01 | Stationary ARMA Model (Hamilton, Ch.3, 5) (i). Population Characteristics (ii). Estimation.                                                                                                              |
| 6    | 2018/04/02~2018/04/08 | Stationary ARMA Model (Hamilton, Ch.3, 5) (i). Population Characteristics (ii). Estimation.                                                                                                              |
| 7    | 2018/04/09~2018/04/15 |                                                                                                                                                                                                          |
| 8    | 2018/04/16~2018/04/22 | Asymptotic Distribution Theory: i.i.d. process, serially correlated process, and Martingale Difference process. (Hamilton, Ch. 7, White) (i). Law of large number. (ii). Central Limit Theorem           |
| 9    | 2018/04/23~2018/04/29 | Stationary Vector Time Series (Hamilton, Ch. 10, 11)(i). Law of large number.(ii). Central Limit Theorem                                                                                                 |
| 10   | 2018/04/30~2018/05/06 | 期中考                                                                                                                                                                                                      |
| 11   | 2018/05/07~2018/05/13 | Stationary Vector Time Series (Hamilton, Ch. 10, 11)(i). Law of large number.(ii). Central Limit Theorem                                                                                                 |
| 12   | 2018/05/14~2018/05/20 | Models of Nonstationary Time Series (Hamilton, Ch. 15) (i). Trend Stationary Process (ii). Difference Stationary Process                                                                                 |
| 13   | 2018/05/21~2018/05/27 | Models of Nonstationary Time Series (Hamilton, Ch. 15) (i). Trend Stationary Process (ii). Difference Stationary Process                                                                                 |
| 14   | 2018/05/28~2018/06/03 | Univariate Process with Unit Roots: (Hamilton, Ch. 17) (i). Brownian Motion(ii). Functional Central Limit Theorem (iii). Dickey-Fuller test (iv). Phillips-Perron Tests(v). Augmented Dickey-Fuller Test |
| 15   | 2018/06/04~2018/06/10 | Spurious Regression: (Hamilton, Ch. 18)                                                                                                                                                                  |
| 16   | 2018/06/11~2018/06/17 | Cointegration: (Hamilton, Ch. 19) (i). Granger Representation Theorem (ii). Engle-Granger Two Step method                                                                                                |
| 17   | 2018/06/18~2018/06/24 | Johansen' s Maximum Likelihood Analysis of Cointegrated System                                                                                                                                           |
| 18   | 2018/06/25~2018/07/01 | 期末考                                                                                                                                                                                                      |

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| 課業討論時間 |
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時段1 Time period 1:  
時間 Time：星期一10:00~12:00  
地點 Office/Laboratory：SS 3002  
時段2 Time period 2：  
時間 Time：星期四15:00~17:00  
地點 Office/Laboratory：SS 3002

## 系所學生專業能力/全校學生基本素養與核心能力

[illegible]

|                                                                          |   |   |   |   |   |   |   |   |  |  |  |
|--------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|--|
| 展的瞭解及規劃。                                                                 |   |   |   |   |   |   |   |   |  |  |  |
| 7.專業能力與職涯發展。                                                             | V | V |   |   | V | V | V |   |  |  |  |
| 8.發掘、分析及處理經濟相關議題之能力。                                                     |   |   |   |   |   |   |   |   |  |  |  |
| 9.掌握國際經濟脈動，培養宏觀國際視野。                                                     |   |   |   |   |   |   |   |   |  |  |  |
| 10.具備專業資格或技能證明文件之取得能力。                                                   |   |   |   |   |   |   |   |   |  |  |  |
| 11.遵守生活倫理及承擔社會責任之能力。                                                     |   |   |   |   |   |   |   |   |  |  |  |
| 12.對自己職涯發展有充分的瞭解及規劃。                                                     |   |   |   |   |   |   |   |   |  |  |  |
| 13.瞭解與自我職涯發展有關的產業環境與發展情形。                                                |   |   |   |   |   |   |   |   |  |  |  |
| 14.提昇面對問題時理性解決問題之能力。                                                     |   |   |   |   |   |   |   |   |  |  |  |
| ※全校學生基本素養與核心能力 Basic disciplines and core capabilities of the university |   |   |   |   |   |   |   |   |  |  |  |
| 1.表達與溝通能力。                                                               | V |   |   |   | V |   |   | V |  |  |  |
| 2.探究與批判思考能力。                                                             | V |   |   |   |   |   |   |   |  |  |  |
| 3.終身學習能力。                                                                |   |   |   |   |   |   |   |   |  |  |  |
| 4.倫理與社會責任。                                                               |   |   |   |   |   |   |   |   |  |  |  |
| 5.美感品味。                                                                  |   |   |   |   |   |   |   |   |  |  |  |
| 6.創造力。                                                                   | V |   |   | V |   | V |   |   |  |  |  |
| 7.全球視野。                                                                  |   |   |   |   |   |   |   |   |  |  |  |
| 8.合作與領導能力。                                                               | V |   | V |   |   |   |   |   |  |  |  |
| 9.山海胸襟與自然情懷。                                                             |   |   |   |   |   |   |   |   |  |  |  |

