McGill University
Department of Economics
Econ 763: Time Series and Financial Econometrics
Winter 2016
Course outline
(Preliminary)

Professor: Jean-Marie Dufour

January 2016
Version: February 11, 2016

Documents and other material relevant to the course will be available from my web page:

`http://www.jeanmariedufour.com`
`http://www.jeanmariedufour.org`

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Lecture hours: Tuesday 18:05 - 20:55 (to confirm)
Beginning: January 2016. End: April 2016 (to confirm)
Room: Leacock 520 (to confirm)
Office hours: by appointment
Teaching assistants: Nazmul Ahsan (to be confirmed)
TA sessions: to be determined
e-mail: `jean-marie.dufour@mcgill.ca`

Evaluation will be based on 3 elements (percentage refer to the entire year's grade);

1. a mid-term exam: 25%;
2. assignments and term paper: 25%;
3. a final exam (April 2014): 50%.

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest/) for more information).
L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/).

The following textbooks will be used in this course.

Brockwell, D. and Davis, R. A. (1991). Time Series: Theory and Methods, Second Edition. Springer-Verlag, New York. (BD)

Hamilton, J. (1994). Time Series Analysis. Princeton University Press, Princeton, NJ. (H)

Ait-Sahalia, Y., and Hansen, L. P. (2010). Handbook of Financial Econometrics, Volumes 1 and 2. Horth-Holland, Amsterdam.

Arratia, A. (2014). Computational Finance: An Introductory Course with R. Atlantis Press, Paris, and Springer, Berlin.

Bossaerts, Peter (2002) The Paradox of Asset Pricing. Princeton University Press.

Campbell, J.Y, Lo, A. W., and MacKinlay, A. C. (1997). The Econometrics of Financial Markets. Princeton University Press.

Cochrane, J. (2001). Asset Pricing. Princeton University Press.

Gouriéroux, C., and Jasiak, J. (2001). Financial Econometrics: Problems, Models and Methods. Princeton University Press.

Ruppert, D. (2004). Statistics and Finance. Springer.

Singleton, K. J. (2006) Empirical Dynamic Asset Pricing: Model Specification and Econometric Assessment. Princeton University Press.

Class schedule

Week	Day	Time (18:05-20:55)	
1	Tuesday	12 January 2016	
2	Tuesday	19 January 2016	
3	Tuesday	26 January 2016	
4	Tuesday	27 January 2016	
5	Tuesday	2 February 2016	
6	Tuesday	9 February 2016	
7	Tuesday	16 February 2016	
8	Tuesday	23 February 2016	Mid-term exam
9	Tuesday	1 March 2016	Study break
10	Tuesday	8 March 2016	
11	Tuesday	15 March 2016	
12	Tuesday	22 March 2016	
13	Tuesday	29 March 2016	
14	Tuesday	5 April 2016	
15	Tuesday	12 April 2016	

Course outline

1. Time series analysis
    (a) Introduction
    (b) Stochastic processes
        i. Basic theory
        ii. Spectral analysis
    (c) Prediction and efficient markets
    (d) Continuous time models
    (e) Testing random walk and predictability
    (f) Nonstationarity
    (g) Building univariate time series models
    (h) Multivariate time series models
    (i) Long memory
2. Financial econometrics
    (a) Introduction: the problems of financial econometrics
    (b) Portfolio theory and the Capital asset pricing model (CAPM)
    (c) Volatility modelling
        i. The role of volatility modelling
        ii. Conditional heteroskedasticity: GARCH and stochastic volatility
        iii. Realized volatility
    (d) Heavy tails: theory and inference
    (e) Factor models
    (f) Dynamic optimization models and GMM
    (g) Quantile methods and value at risk
    (h) Options pricing