

MATH 5P84 – Time Series Analysis and Stochastic Processes  
Course Outline

**List of topics:**

- Multivariate Normal distribution; marginal and conditional distribution; partial correlation coefficient
- Autoregressive and Moving Average models; stability analysis; serial correlation; correlogram; forecasting
- Parameter estimation; large-sample theory
- Spectral analysis; periodogram; filtering; smoothing a spectrum; spectral and lag windows

**References:**

1. Vrbik J, Vrbik P: Informal Introduction to Stochastic Processes with Maple (last chapter only), Springer, 2013
2. William W S Wei: Time Series Analysis (Univariate and multivariate methods), 2<sup>nd</sup> Edition, Pearson (Addison-Wesley), 2006
3. Peter J Brockwell, Richard A Davis: Introduction to Time Series and Forecasting, 2<sup>nd</sup> Edition, Springer text in Statistics, 2002

**Marking scheme:**

Weekly assignments:       60%  
In-lab 3 hour final exam:  40%

Academic misconduct is a serious offence. The principle of academic integrity, particularly of doing one's own work, documenting properly (including use of quotation marks, appropriate paraphrasing and referencing/citation), collaborating appropriately, and avoiding misrepresentation, is a core principle in university study. Students should consult Section VII, "Academic Misconduct", in the "Academic Regulations and University Policies" entry in the Undergraduate Calendar, available at <https://brocku.ca/webcal/2019/undergrad/areg.html> to view a fuller description of prohibited actions, and the procedures and penalties.

The University is committed to fostering an inclusive and supportive environment for all students and will adhere to the Human Rights principles that ensure respect for dignity, individualized accommodation, inclusion and full participation. The University provides a wide range of resources to assist students, as follows:

- a) If you require academic accommodation because of a disability or an ongoing health or mental health condition, please contact Student Accessibility Services at [askSAS@brocku.ca](mailto:askSAS@brocku.ca) or 905 688 5550 ext. 3240.

b) If you require academic accommodation because of an incapacitating medical condition, you must, as soon as practicable, inform your instructor(s) of your inability to complete your academic work. You must also submit a Brock University Student Medical Certificate (found at <https://brocku.ca/registrar/toolkit/forms>). The University may, at its discretion, request more detailed documentation in certain cases. If you are unable to write a scheduled examination due to an incapacitating medical condition, you must follow the process set out in the [Faculty Handbook III:9.4.1](#).