MS course: TIME SERIES ANALYSIS WITH APPLICATIONS IN FINANCE

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TOPICS:

- Stationary time series, covariance function and spectral representation.
- Estimating parameters of stationary time series, ergodicity, periodogram.
- One-dimensional processes: classification, ARMA, regular and singular time series.
- Wold decomposition. Factorization of rational spectral densities.
- Stochastic linear systems, state equations.
- Multivariate stationary time series of constant rank. Multivariate Wold decomposition, innovation subspaces.
- Dimension reduction and prediction. Kálmán filtering, dynamic factor analysis.
- Non-stationary processes, co-integration.
- Stochastic volatility: ARCH and GARCH models.
- Financial applications.

Requirements: see on the homepage https://www.math.bme.hu/∼marib/time
Books:

- Bolla, M. and Szabados, T., Multidimensional Stationary Time Series (in preparation, to be published by Taylor and Francis).
- Brockwell, P. J. and Davis, R. A., Introduction to time series and forecasting, Springer (2016).
- Deistler, M. and Scherrer, W., Modelle der Zeitreihenanalyse, Springer (2018).
- Gerencsér, L., Vágó, Zs. and Gerencsér, B., Financial time series, Pázmány Péter Catholic University (2013), ISBN 978-963-308-161-7.