|  |
| --- |
|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | **Faculty of Sciences and Mathematics** |
| **GENERAL INFORMATION** |
| Study program  | **Mathematics** |
| Study Module (if applicable) | / |
| Course title | Time Series in Theory and Practice |
| Level of study | ☐Bachelor ☐ Master’s $$ Doctoral |
| Type of course | ☐ Obligatory $$ Elective |
| Semester  |  ☐ Autumn $$Spring |
| Year of study  | Second |
| Number of ECTS allocated | 12 |
| Name of lecturer/lecturers | Biljana Č. Popović |
| Teaching mode |  $$Lectures ☐Group tutorials $$ Individual tutorials ☐Laboratory work ☐ Project work $$ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| *Introduction to numerous existing models of time series and their application. Potential of constructing new models of modelling real data and proving their statistical properties.*  |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Time series models with constant and random coefficients. Stationarity and stability. ARMA and ARIMA models. Testing for unit roots. Estimation of parameters of these models. Testing randomness of coefficients. GARCH models and other heteroscedastic models. Stochastic volatility models. VaR. Multidimensional time series. Application of the models. MCMC simulation. |
| **LANGUAGE OF INSTRUCTION** |
| ☐Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)$$Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** |  | **Written examination** | **50** |
| **Practical teaching** |  | **Oral examination** | **50** |
| **Teaching colloquia** |  | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |