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| **Study programmes**: Bachelor studies – Mathematics | |
| **Course name**: Elements of financial mathematics | |
| **Lecturers**: Bojana Milošević | |
| **Status**: Optional | |
| **ECTS**: 6 | |
| **Attendance prerequisites**: Stochastic processes | |
| **Course aims**: Learning basics about financial instruments as well as their pricing in discrete time. | |
| **Course outcome**: Upon completing the course, a student is capable of modeling and pricing financial data. | |

**Course content**:

Interest rates (different types). Continuously varying interest rates. Effective, nominal and compound interest rates. Present value, net return, theorem of equivalence of two cash flows. Internal rate of return. Cycles, inflation. Fixed income derivatives. Duration, convexity. Non-fixed income derivatives. Modeling asset prices. Wiener process. Geometric Brownian motion. Binomial model. Options and its properties. European and American options and inequalities, with and without dividends. Forward contract. Option pricing in binomial model. Black-Scholes formula. Greeks, hedging. VaR. CAPM.

**Literature**:

Слободанка Јанковић: *Елементи финансијске математике*, 2014 (скрипте).

J.C. Hull: *Options, Futures, and Other Derivatives*, Prentice Hall, 2006.

А.Н. Ширяев: *Основы стохастической финансовой математики*, Фазис, Москва, 1997.

| Number of hours: **5** | Lectures: **3** | Tutorials: **2** | Laboratory: **-** | Research: **-** |
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**Teaching and learning methods**: Frontal / Tutorial

| Assessment (maximal 100 points) | | | |
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| **Course assignments** | **points** | **Final exam** | **points** |
| Lectures | | Written exam | - |
| Exercises / Tutorials | 10 | Oral exam | 40 |
| Colloquia | 40 | Written-oral exam | |
| Essay / Project | 10 | | |