# [A-3]COURSE SYLLABUS

## 1. Course Description (Approximately 100 words)

The course provides coverage of important topics in modern Quantitative Finance and Risk Management at the advanced undergraduate level. It is intended for the 4th-year undergraduate students.
Particular attention is given to the topics such as the Efficient Market Hypothesis, financial markets micro-structure and types of arbitrage, general principles of modelling the price dynamics of financial assets, market risk and other types of financial risks, Value-at-Risk (VaR) approach and applications, modelling of extreme market events, VaR analysis for financial derivatives using the Kolmogorov equations framework, foundations of the copula methods, modelling of periodic and quasi-periodic trends in time series in connection with technical analysis, and the foundations of high-frequency arbitrage trading.
The topics covered in this course will enable the students to develop the theoretical knowledge and practical skills required for successful working with multiple types of risks in modern

## 2. Course Goals and Objectives (Approximately 100 words)

The goal of this course is to give students insights in the functioning of financial markets, understanding of measuring and forecasting financial risks. This course is aimed at giving students instruments required in order to analyze issues in asset pricing and market finance. After the course students should be familiar with recent empirical findings based on financial econometric models, have a good command of basic econometric techniques and understand practical issues in the forecasting of key financial market variables

## 3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

1. Quantitative finance by Khodiev Bakhodir, Tashkent 2018

## 4. Reference

1. Christoffersen, P.F., Elements of Financial Risk Management. Second Edition. Academic Press, London.
2. Diebold, F.X., Elements of Forecasting. Fourth Edition. Thomson South-Western, Canada.

## 5. Course Requirements and Grades

The combination of coursework and the end of module examination will provide appropriate assessment vehicles for this module ' s various learning outcomes. The coursework is formative and to this extent tests a subset of the learning outcomes. The end of module examination is essentially summative and assesses further the learning outcomes assessed in the coursework. Weight: 30%.
The end of module examination is an appropriate testing. The final examination primarily tests the ability of students to elaborate on particular concept or theory in the context of modern microeconomic and macroeconomic models, and to distinguish between different theoretical approaches. Weight: 70%.
In-module assessment: Coursework 30% - formative and summative. It assesses whether

## 6. Course Calendar

| Week | Main Content |
|---|---|
| 1 | Concepts and measures of risk |
| 2 | Time-series analysis |
| 3 | Empirical features of financial asset returns |
| 4 | Market risk models |
| 5 | Models of financial market correlations |
| 6 | Forecast evaluation methods |
| 7 | Risk management |
| 8 | Asset allocation decisions |
| 9 | Market microstructure and high frequency data |
| 10 | Risk Measure Classification |
| 11 | Desirable Properties of Risk Measures |
| 12 | Loss-Based Risk Measures |
| 13 | Tail Risk Analysis: Black Swans, Dragons & Extreme Events |
| 14 | Investment Risk Management |