

# Kandidatkurser Matematik-Økonomi

## Efterår 2026

### Retning Finansiering

#### Udbudt af BSS:

- Asset Pricing (10 ECTS)
- Applied Financial Econometrics (10 ECTS)
- Real Estate Finance and Investments (5 ECTS)
- Machine Learning in Finance (5 ECTS)
- Behavioral Corporate Finance (10 ECTS)
- Household Finance (10 ECTS)
- Corporate Finance (10 ECTS)
- Financial Engineering (10 ECTS)<sup>1</sup>
- Financial Econometrics (10 ECTS)
- Time Series Econometrics (10 ECTS)
- Empirical Asset Pricing (10 ECTS)
- Machine Learning Methods in Empirical Economics (10 ECTS)
- (P) Empirical Asset Pricing (10 ECTS)
- Sustainable Investing (10 ECTS)

#### Udbudt af Institut for Matematik:

- Pricing and Hedging of derivatives (10 ECTS)<sup>2</sup>
- Reinforcement Learning (10 ECTS)
- Monte Carlo Simulation (10 ECTS)<sup>3</sup>
- Insurance Mathematics (10 ECTS)
- Stochastic Calculus (10 ECTS)

Kurser med superscript betragtes som værende 'kernekurser'. Det forventes, at den studerende følger min. 4–6 kernekurser i løbet af kandidatuddannelsen.

Finansieringsgruppen på BSS har givet følgende beskrivelse af kernekurserne:

- (1) Financial engineering covers advanced topics on modern models and methods for derivatives. It includes in-depth study of stochastic volatility models, jump processes, and rough path approaches. It also explores advanced numerical techniques for pricing, such as approximation methods and Fourierbased methods. It also explores developments in derivatives markets, with particular emphasis on variance and volatility products.
- (2) The course on pricing and hedging derivative securities presents the core principles with a primary focus on options. It covers key modeling frameworks used for valuation and risk management, particularly local volatility models, with some discussion

of stochastic volatility models. The course also develops the martingale approach to arbitrage theory, emphasizing the links between no-arbitrage, market completeness, and martingale measures. Applications focus mainly on equity markets, with relevance to other areas such as energy markets.

- (3) The course on Monte Carlo simulation introduces the core principles and methods for the analysis of complex probabilistic models. It covers the fundamental tools used to approximate quantities that cannot be calculated analytically, with emphasis on how modern computational methods can be used to study high-dimensional and otherwise intractable problems. The course is motivated by applications in areas such as data science and finance, where simulation-based methods play a central role in statistical and quantitative analysis.

## **Retning Nationaløkonomi**

### **Udbudt af BSS:**

- [Micro 2 \(10 ECTS\)](#)<sup>1</sup>
- [Macro 2 \(10 ECTS\)](#)<sup>2</sup>
- [The Economics of the Welfare State \(10 ECTS\)](#)
- [International Economics \(10 ECTS\)](#)
- [Economic Growth and the Environment \(10 ECTS\)](#)
- [Labour Economics \(10 ECTS\)](#)<sup>3</sup>
- [Politics and Economics of the EU \(10 ECTS\)](#)
- [Health Economics \(10 ECTS\)](#)
- [Economics of Education and Inequality \(10 ECTS\)](#)
- [\(P\) Applied Microeconometrics \(10 ECTS\)](#)
- [Microeconometrics \(10 ECTS\)](#)
- [\(P\) Environmental Economics \(10 ECTS\)](#)

Udover ovenstående kurser udbydes også et PhD kursus i Makroøkonomi (5 ECTS). For at kunne følge dette kursus er det dog nødvendigt at spørge/korrespondere med Niels Skipper først ([nskipper@econ.au.dk](mailto:nskipper@econ.au.dk)).

Kurserne [Micro 2](#) og [Labour Economics](#) betragtes som kernekurser inden for mikroøkonomi. Kurset [Macro 2](#) samt PhD kurset inden for makroøkonomi betragtes som kernekurser indenfor makroøkonomi. Kurserne giver et centralt fundament og er et vigtigt udgangspunkt for senere specialiserede kurser.

### **Andre kurser udbudt fra BSS til alle retninger**

- [Theories of the Firm \(10 ECTS\)](#)
- [Econometric Methods in Economic Consulting \(10 ECTS\)](#)
- [Cost Benefit Analysis \(10 ECTS\)](#)
- [Generative AI with LLMs \(5 ECTS\)](#)
- [Strategic Business Intelligence and AI \(10 ECTS\)](#)

- Data and Visualisation in BI (10 ECTS)
- Forecasting with Machine Learning (5 ECTS)

## **Retning Operationsanalyse**

### **Udbudt af Institut for Matematik:**

- Applied optimization: Location Planning (10 ECTS)<sup>1</sup>
- Graph Theory 2 (10 ECTS)<sup>2</sup>

### **Udbudt af BSS:**

- Supply Chain Design and Management (10 ECTS)
- Decision Modelling (10 ECTS)
- Reinforcement Learning for Business (10 ECTS)
- Service Analytics: From Data to Decision (5 ECTS)
- Applied Project in Service Analytics (10 ECTS)

### **Udbudt af Institut for Datalogi:**

- Advanced Data Management and Analysis (10 ECTS)
- Computational Geometry: Theory and Experimentation (10 ECTS)
- Software Engineering and Architecture (10 ECTS)
- Quantum Information Processing (10 ECTS)
- Theory of Algorithms and Computational Complexity (10 ECTS)
- Machine Learning (10 ECTS)

- (1) Placing items at locations is a key problem in Operations Research. The course on Location Planning is therefore considered a core course.
- (2) The problems of choosing paths, placement of items and designing networks can be viewed as problems of choosing nodes/edges in a graph. The courses on graph theory are therefore considered core courses.

## **Andre kurser udbudt fra Institut for Matematik (oa) til alle retninger**

- Causal Inference (10 ECTS)
- Advanced Statistical Learning (10 ECTS)
- Statistical Models (10 ECTS)
- Project Work in Mathematics-Economics 10 ECTS (10 ECTS)
- Project Work in Mathematics-Economics 5 ECTS (5 ECTS)
- Vocational Training Project (10 ECTS) (erhvervsprojekt)
- Deep Learning (10 ECTS)

- Statistical Learning and Machine Learning (10 ECTS)