Technische Universität München

Module Description

MA5709: Investment Strategies

TUM Department of Mathematics

Module level:	Language:	Module duration:	Occurrence:
Master	English	one semester	irregularly

Credits*:	Total number of hours:	Self-study hours:	Contact hours:
5	150	105	45

* The number of credits can vary depending on the corresponding SPO version. The valid number is always indicated on the Transcript of Records or the Performance Record.

Description of achievement and assessment methods:
The module examination is based on a written exam (60 minutes). It is examined how deep students understand the theoretical fundamentals of dynamic portfolio optimization, are familiar with static and dynamic efficient lines and whether they can compute optimal investment strategies.

Exam type:	Exam duration (min.):	Possibility of re-taking:	Homework:
written	60	In the next semester: No At the end of the semester: Yes	No

Lecture:	Conversation:	Written paper:
No	No	No

(Recommended) requirements:
MA2409 Probability Theory, MA3702 Continous Time Finance

Contents:
This course gives an overview on the most important static and dynamic investment strategies and presents their mathematical background. It is supplemented by an introduction to stochastic control methods and utility maximization.

Study goals:
At the end of the module students are able to create new investment strategies, evaluate their present values, analyse the risk of different strategies and apply different concepts of modern finance in the given context.

Teaching and learning methods:
The module consists of the lecture supplemented by an exercise session. The lecture material is presented with slide presentations and mathematical proofs are presented on the blackboard. The students are encouraged to study course references and course subjects. The exercise session consists of theoretical and computer-oriented exercises. In the theoretical exercises students will work under instructor assistance on assignments, sometimes in teamwork. The exercises contribute to a better understanding of the lecture materials.

Media formats:
blackboard, assignments

Literature:
R. Zagst: Interest Rate Management, Springer Finance, 2002.
S.E. Shreve: Stochastic calculus for Finance II: Continuous-Time Models, Springer Finance, 2004.

J.C. Hull: Options, Futures, and Other Derivatives, Prentice-Hall, 2006.
K. Hinderer: Grundlagen der Wahrscheinlichkeitstheorie, Springer, 1972.
R.C. Merton: Continuous-Time Finance, Blackwell Publishers Inc., 1992.
R. Korn, E. Korn: Optionsbewertung und Portfolio- Optimierung: Moderne Methoden der Finanzmathematik, Vieweg und Teubner, 2001.
R. Korn: Optimal Portfolios: Stochastic Models for Optimal Investment and Risk Management in Continuous Time, World Scientific, 1997.
I. Karatzas, S.E. Shreve: Methods of Mathematical Finance, Springer, 2004.
R. Bellman: Dynamic Programming, Princeton University Press, 1957.
S.E. Dreyfus: Dynamic programming and the calculus of variations, Academic Press Inc., 1965.

Responsible for the module:
Zagst, Rudi; Prof. Dr.: zagst@tum.de

Courses (Type, SH) Lecturer:

For further information about this module and its allocation to the curriculum see:
https://campus.tum.de/tumonline/wbModHb.wbShowMHBReadOnly?pKnotenNr=668482

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