

## Module Description

### MA4711: Credit Derivatives

#### TUM Department of Mathematics

<b>Module level:</b> Master	<b>Language:</b> English	<b>Module duration:</b> one semester	<b>Occurrence:</b> irregularly
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<b>Credits*:</b> 5	<b>Total number of hours:</b> 150	<b>Self-study hours:</b> 105	<b>Contact hours:</b> 45
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\* 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 examination consists of a written exam (60 minutes) or an oral exam (30 minutes).

<b>Exam type:</b> written or oral	<b>Exam duration (min.):</b> 60 (schriftlich) oder 30 (mündlich)	<b>Possibility of re-taking:</b> In the next semester: No At the end of the semester: Yes	<b>Homework:</b> No
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<b>Lecture:</b> No	<b>Conversation:</b> No	<b>Written paper:</b> No
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#### (Recommended) requirements:

MA2409 Probability Theory, MA3702 Continuous Time Finance

#### Contents:

This lecture provides the theoretical foundation for the pricing of credit derivatives. For the valuation of univariate products, various specifications of so-called structural models are discussed. Then, focus is put on reduced form models, including popular examples. For the pricing of portfolio derivatives, copula models, multivariate structural models, and CIID models are investigated.

#### Study goals:

At the end of the module, students are able to analyse the risk involved in credit derivatives. They have a firm overview on commonly used default models (including their distinct advantages and shortfalls) and are able to use them to price credit derivatives.

#### 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:

course reserve, slides, blackboard

#### Literature:

T. Bielecki & M. Rutkowski (2002): Credit Risk: Modeling, Valuation, and Hedging.

N. Bingham & R. Kiesel (2004): Risk Neutral Valuation: Pricing and Hedging of Financial Derivatives.

P. Schönbucher (2003): Credit Derivatives Pricing Models.  
R. Zagst (2002): Interest Rate Management.

**Responsible for the module:**

Scherer, Matthias; Prof. Dr. rer. nat.: [scherer@tum.de](mailto:scherer@tum.de)

**Courses (Type, SH) Lecturer:**

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For further information about this module and its allocation to the curriculum see:  
<https://campus.tum.de/tumonline/wbModHb.wbShowMHBRadOnly?pKnotenNr=664713>

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