

# Modulbeschreibung für Vertiefungsmodule des Wahlpflichtbereiches

<b>Titel des Moduls</b>	Bewertung der Amerikanischen Optionen in Stochastischen Modellen der Finanzmärkten
in englischer Sprache	

<b>R</b>	
<b>A</b>	X

	Vorlesung	Übung
<b>Umfang</b>	2	

## Inhalt

The pricing of derivative securities is one of the interesting and important problems in the mathematical theory of modern finance. A major part of the derivatives being traded at financial markets are *options* of the so-called *American type*, which can be *exercised* by the holders at *any time* up to maturity. The natural mathematical problems arising by stochastic market modeling and related to this type of contracts are to seek for *optimal stopping times*, at which the holder should exercise the given contingent claims. The *rational prices* of such contracts are given by the values of the corresponding *optimal stopping problems* considered under some risk-neutral measures for the underlying risky asset price processes in the efficient market models. It is shown that the optimal stopping times in these problems are the first times when the underlying price processes come into the regions restricted by the *exercise boundaries*. The explicit expressions for the value functions and the boundaries are derived by means of reducing the initial optimal stopping problems to the equivalent *free-boundary problems* and then verifying the candidate solutions by using martingale methods. In the lecture, the problems of pricing of standard and several exotic American and more general *game contingent claims* in different stochastic models of financial markets will be considered.

<b>Voraussetzungen</b>	Stochastik I, II
------------------------	------------------

<b>Regelsemester</b>	ab 6 Fachsemester
----------------------	-------------------

<b>Abschluss</b>	Prüfung
------------------	---------

<b>Prüfungszulassungsvor-</b>	Prüfung
-------------------------------	---------

<b>aussetzung</b>	
-------------------	--

<b>Studienpunkte</b>	4
----------------------	---

R = Reine Mathematik  
A = Angewandte Mathematik