Term Information

Effective Term	Autumn 2020

General Information

Course Bulletin Listing/Subject Area	Mathematics
Fiscal Unit/Academic Org	Mathematics - D0671
College/Academic Group	Arts and Sciences
Level/Career	Graduate, Undergraduate
Course Number/Catalog	5636
Course Title	Stochastic Calculus for Finance II
Transcript Abbreviation	Stochastic Calc 2
Course Description	Continuation of 5635. Feynman-Kac theorem, diffusion with drift, applications to problems in financial mathematics.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	A grade of C- or better in 5635; and enrollment in Math major or Actuarial Science major, or Grad standing; or permission of department.
Exclusions	
Electronically Enforced	Yes

Cross-Listings

Cross-Listings	

Subject/CIP Code

Subject/CIP Code	27.0101
Subsidy Level	Doctoral Course
Intended Rank	Junior, Senior, Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Undestand Feyman-Kac theorem
- Understand mathematics of diffusion with drift.
- Understand the application of stochastic calculus to problems in financial mathematics.

Content Topic List

- Feynman-Kac theorem.
- Interest rate models.
- Diffusion.
- Properties of Brownian motion.
- Cantor stairs, maximum Brownian motion with drift.
- Quadratic variation, Markov property.
- Lookback options, Asian options.
- Change of Numeraire and foreign exchange.
- Forward measure.
- Yield curve evolution models, forward LIBOR model.
- Jump-diffusion and its Ito Calculus.
- Stopping times, American options.

Sought Concurrence

No

Attachments

- Mathematics 5636.pdf: Syllabus

(Syllabus. Owner: Husen,William J)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Husen,William J	02/11/2020 12:25 PM	Submitted for Approval
Approved	Husen,William J	02/11/2020 12:25 PM	Unit Approval
Approved	Haddad,Deborah Moore	02/11/2020 01:58 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	02/11/2020 01:58 PM	ASCCAO Approval

Mathematics 5636
Stochastic Calculus for Finance II

Description: Continuation of 5635. Feynman-Kac theorem, diffusion with drift, applications to problems in financial mathematics.

Credit Hours: 3

Prerequisites: A grade of C- or better in 5635; and enrollment in Math major or Actuarial Science major, or Grad standing; or permission of department.

Text: *Stochastic Calculus for Finance II: Continuous-Time Models*, by Steven E. Shreve, published by Springer, ISBN: 0387401016

Topics List:

1. Feynman-Kac theorem
2. Interest rate models
3. Diffusion
4. Properties of Brownian motion
5. Cantor stairs, maximum Brownian motion with drift
6. Quadratic variation, Markov property
7. Lookback options, Asian options
8. Change of Numeraire and foreign exchange
9. Forward measure
10. Yield curve evolution models, forward LIBOR model
11. Jump-diffusion and its Ito Calculus
12. Stopping times, American options

Course Grade: Grades for this course will be based on student performance according to the following weighting of assessment:

Homework and participation	25%
Midterm exam (up to Ito integral)	25%
Final exam (comprehensive)	50%

Disability Statement: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.

Academic Misconduct Statement: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/.