BGSU Department of Mathematics and Statistics

BOWLING GREEN STATE UNIVERSITY

Weekly Calendar – Spring Semester 2025
Week 7 – February 24 – 28

Monday, February 24	**Undergraduate Committee** 3:30pm – 4:20pm, McLeod Hall 400
Tuesday, February 25	**TTF Candidate Teaching Presentation** 9:00am – 9:30am, McLeod Hall 459 Topic: Candidate's choice from professional actuarial exams **TTF Candidate Open Meeting with Faculty/Graduate Students** 9:45am – 10:45am, McLeod Hall 459 **TTF Candidate Open Meeting with Faculty/Graduate Students** 2:30pm – 3:00pm, McLeod Hall 459 **TTF Candidate Research Presentation** 3:15pm – 4:15pm, McLeod Hall 459 Topic: Risk Allocation in Decentralized Finance (De-Fi) Insurance
Wednesday, February 26	**Peer Mentor Meeting** 12:30pm – 1:20pm, McLeod Hall 400 **Analysis Reading Seminar** 2:30pm – 3:30pm, McLeod Hall 459 Speaker: Salma Hasannejad Title: Universal Functions for the Composition Operator, Part 3 **Peer Mentor Meetings** 3:30pm – 4:20pm, McLeod Hall 459, 238 & 302 **Advisory Committee** 3:30pm – 4:30pm, McLeod Hall 400

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Thursday, February 27	**TTF Candidate Teaching Presentation** 9:00am – 9:30am, McLeod Hall 459 Topic: Candidate's choice from professional actuarial exams **TTF Candidate Open Meeting with Faculty/Graduate Students** 9:45am – 10:45am, McLeod Hall 459 **TTF Candidate Open Meeting with Faculty/Graduate Students** 2:30pm – 3:00pm, McLeod Hall 459 **TTF Candidate Research Presentation** 3:15pm – 4:15pm, McLeod Hall 459 Topic: Worst-Case Reinsurance Strategy with Likelihood Ratio Uncertainty
Friday, February 28	**Colloquium** 3:45pm – 5:00pm, via zoom https://bgsu-edu.zoom.us/j/81537095322?pwd=qsX6D6M4HQhWF3MGzQCEaVvTJYqIn6.1 Meeting ID: 815 3709 5322 Passcode: 158399 Speaker: Jess Ellis Hagman, Colorado State University Title: Developing a Critical Cycle to Support 'Critical Transformations' in University Mathematics

ABSTRACTS

TTF Candidate Research Presentation (Tuesday)

Topic: Risk Allocation in Decentralized Finance (De-Fi) Insurance

Abstract: Decentralized Finance (De-Fi) insurance has rapidly evolved in the insurance market. It eliminates the centralized role of insurers and decentralizes their functions among ordinary individuals. This presentation focuses on two prominent models in the De-Fi insurance market: peer-to-peer insurance and distributed insurance. We examine the design of their risk allocations from two key perspectives. First, using the criterion of minimizing total variance, we demonstrate that the optimal risk-sharing strategy should adopt a linear form. While this aligns with conventional assumption, our analysis uncovers a critical insight: the linear strategy should be applied to residual risks rather than the original risks. Second, to support the market development of distributed insurance, we propose key properties and design corresponding risk allocation models. Notably, we find that the risk allocation formulated from two distinct approaches exhibits strong similarities.

TTF Candidate Research Presentation (Thursday)

Title: Worst-Case Reinsurance Strategy with Likelihood Ratio Uncertainty

Abstract: We investigate the optimal reinsurance strategy for an insurer in the worst- case scenario. An optimal reinsurance problem is a risk sharing problem faced by an insurer and a reinsurer in the reinsurance market. Since only partial information on the underlying probability measure is available, we assume that an insurer defines uncertainty sets by using the likelihood ratio between the reference probability measure and an alternative probability measure, and then, considers the robust risk measure in the worst-case scenario. In our work, we first focus on a non-cooperative model, and characterize the relation between the optimal reinsurance strategies in the regular-case when the reference probability measure is used and in the worst-case scenario. The insurer can further assess the inadequacy of her reinsurance coverage and the shortage of her capital reserve in the worst-case scenario. Use those results, we solve the optimal reinsurance strategy when the insurer uses an expectile risk measure, which is a popular risk measure in the literature of insurance. Second, we propose a cooperative model, which can be viewed as a general risk sharing problem between two agents in a comonotonic market. In this model, we characterize the optimal reinsurance strategy and determine the worst-case risk measure value.

Colloquium

Title: Developing a Critical Cycle to Support 'Critical Transformations' in University Mathematics

Abstract: In this talk, I will define what my research team means by "critical transformations" in mathematics department, why we need them, some tensions that we have witnessed and experienced ourselves while working with 3 mathematics department to achieve critical transformations, and finish with a new proposed process for how a department can achieve critical transformations.

Bio: Jess Ellis Hagman is an Associate Professor in the Department of Mathematics at Colorado State University in Fort Collins. She completed her PhD in Mathematics Education from the joint program between San Diego State University and the University of California, San Diego. Her area of research is undergraduate mathematics education. Her work is focused on working with mathematics departments to support them to make critical transformations of their introductory mathematics programs. In addition to her research, she loves working with graduate students, spending playful time outside with her family, working in her garden, and playing in and near water of all forms.