

Mathematical Statistics

MAS 713

Introduction

This lecture

- 1 Who am I?
- 2 Who are you?
- 3 Schedule
- 4 Teaching method
- 5 Learning subjects
- 6 Learning outcomes
- 7 Learning resources
- 8 Semester Dates
- 9 Indicative assessment
- 10 Questions

Background

- **Since 2019:** Nanyang Assistant Professor at NTU
- **06.2015-12.2018:** Postdoc in Financial and Insurance Mathematics at ETH Zurich
- **02.2012-05.2015:** PhD in Mathematics, ETH Zurich (Columbia U.)
Supervisors: Prof. Marcel Nutz (Columbia University),
Prof. Martin Schweizer (ETH Zurich)
Thesis title: Knightian Uncertainty in Mathematical Finance
- **10.2006-10.2011:** Bachelor and Master in Mathematics at ETH

Research interests:

- Machine Learning Algorithms in Finance and Insurance
- Model Uncertainty in Financial Markets
- Financial and Insurance Mathematics
- Stochastic Analysis & Stochastic Optimal Control
- Green Finance

Who are you?

Who are you?

Schedule

1 **Lecture:** Friday 13:00-17:00 at MAS Exec Room 2

Teaching method

- 1 We shall have a lecture followed by a tutorial
- 2 No designated tutorials
- 3 Many examples throughout the lectures
- 4 No homework assignments, only recommended exercises

Learning subjects

- Part 0: Introduction
- Part I: Descriptive statistics
- Part II: Elements of Probability
- Part III: Random variables
- Part IV: Confidence interval
- Part V: Point Estimation
- Part VI: Maximum Likelihood Estimation
- Part VII: Bayesian Inference
- Part VIII: Hypothesis Testing
- Part IX: Regression
- Revision

Learning outcomes

Upon successful completion of the requirements for this course, students should have the knowledge and skills to:

- 1 Demonstrate an understanding of probability theory
- 2 Demonstrate knowledge of, and properties of, statistical models in common use
- 3 Understand the basic principles underlying statistical inference (estimation and hypothesis testing)
- 4 Be able to construct tests and estimators, and derive their properties
- 5 Understand the difference between Frequentist and Bayesian approaches

Learning resources

- 1 **Slides** will be available online via NTULearn and my homepage
- 2 **Book:** Statistical Inference, 2nd Ed,
by George Casella and Roger L. Berger, 2001
(You can find it using google)
- 3 **Consult** and **discuss** with your class mates
- 4 My **email** address: ariel.neufeld@ntu.edu.sg

Semester Dates

SEMESTER 2

2021

JANUARY							FEBRUARY							MARCH											
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S					
					1	2				1	2	3	4	5	6				1	2	3	4	5	6	
Teaching Week	3	4	5	6	7	8	9	4	5	6	7	8	9	10	11	12	13	8	7	8	9	10	11	12	13
1	10	11	12	13	14	15	16	5	7	8	9	10	11	12	13	9	14	15	16	17	18	19	20		
2	17	18	19	20	21	22	23	6	14	15	16	17	18	19	20	10	21	22	23	24	25	26	27		
3	24	25	26	27	28	29	30	7	21	22	23	24	25	26	27	11	28	29	30	31					
	31								28																

APRIL							MAY							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	
					1	2	3							1
Teaching Week	11							2	3	4	5	6	7	8
12	4	5	6	7	8	9	10	9	10	11	12	13	14	15
13	11	12	13	14	15	16	17	16	17	18	19	20	21	22
	18	19	20	21	22	23	24	23	24	25	26	27	28	29
	25	26	27	28	29	30		30	31					

Students' Union Day

15 Sep 2020

No classes for UG programmes from 1030 to 1430 hours.

SINGAPORE PUBLIC HOLIDAYS

Hari Raya Haji	31 Jul 2020 (Fri)
National Day	9 Aug 2020 (Sun)
Deepavali	14 Nov 2020 (Sat)
Christmas Day	25 Dec 2020 (Fri)
New Year's Day	1 Jan 2021 (Fri)
Chinese New Year	12 - 13 Feb 2021 (Fri - Sat) (Indicative)
Good Friday	2 Apr 2021 (Fri) (Indicative)
Labour Day	1 May 2021 (Sat)
Hari Raya Puasa	13 May 2021 (Thu) (Indicative)
Vesak Day	26 May 2021 (Wed) (Indicative)
Hari Raya Haji	20 Jul 2021 (Tue) (Indicative)

Public holiday dates are marked in red on the calendar.

Indicative assessment

- ① Individual Oral Exam (30 minutes each)

Date: T.B.A.

Questions

Questions?