

Mathematical Statistics

MH7004

Introduction

This lecture

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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
- Stochastic Optimization and Applied Probability Theory

Who are you?

Who are you?

Schedule

① **Lecture:** Friday 13:30-17:20 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

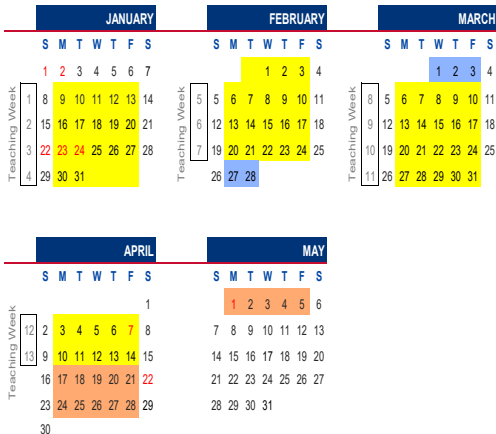
Learning resources

- 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

2023



* dates may change in tandem with the evolving COVID-19 situation

SINGAPORE PUBLIC HOLIDAYS

Hari Raya Haji	10 Jul 2022 (Sun)
National Day	9 Aug 2022 (Tue)
Deepavali	24 Oct 2022 (Mon)
Christmas Day	25 Dec 2022 (Sun)
New Year's Day	1 Jan 2023 (Sun)
Chinese New Year	22 - 23 Jan 2023 (Sun - Mon) *24 Jan 2023 (Tue) will be a public holiday.
Good Friday	7 Apr 2023 (Fri)
Hari Raya Puasa	22 Apr 2023 (Sat)
Labour Day	1 May 2023 (Mon)
Vesak Day	2 Jun 2023 (Fri)
Hari Raya Haji	29 Jun 2023 (Thu)

Public holiday dates are marked in red on the calendar.

Note: Classes will proceed normally on the immediate Monday following a public

Indicative assessment

- ① Individual Oral Exam (30 minutes each)

Date: T.B.A.

Questions

Questions?