MA4L3 Large Deviation Theory

2023, term 2
Stefan Adams

General Information

Lectures: Tuesday 9-11am in B3.02 and Friday 10-11am in B3.02. Lecture video capture - see moodle page.

Office hours (B2.18): Tuesday 1pm or by appointment.

Support classes: from Week 2 by Andreas Koller (email: Andreas.Koller@warwick.ac.uk). Wednesday 12pm-1pm in B3.01.

Example sheets: There are 4 assessed example sheets. The best three marked example sheets account for 15% of the final mark.

Hand-in times (submission on moodle page) and discussion in TA class – assignment sheets:

Sheet	Week	Date submission	Discussion in Support class/lecture
1	3	26.01.2023 at noon 12 pm	Week 4, Wednesday 01.02.2023
2	5	09.02.2023 at noon 12 pm	Week 6, Wednesday 15.02.2023
3	8	02.03.2023 at noon 12 pm	Week 9, Wednesday 08.03.2023
4	10	16.03.2023 at noon 12 pm	Week 10, Friday 17.03.2023

Assessment: Exam (85%) & Homework (3 out of 4 example sheets) (15%)

Revision classes: The lecturer will schedule two revision classes in spring 2023 as preparation for the exam.

Lecture notes: Notes will be provided.

Books:

[1] Frank den Hollander, *Large Deviations* (Fields Institute Monographs), (paperback), American Mathematical Society (2008).

[2] Amir Dembo & Ofer Zeitouni, *Large Deviations Techniques and Applications* (Stochastic Modelling and Applied Probability), (paperback), Springer (2009).

[3] Jin Feng and Thomas G. Kurtz, *Large Deviations for Stochastic Processes*, American Mathematical Society (2006).

Other relevant books and lecture notes:

[a] Stefan Adams, *Lectures on mathematical statistical mechanics*, Communications of the Dublin Institute for Advanced Studies Series A (Theoretical Physics), No. 30 , available online
http://www2.warwick.ac.uk/fac/sci/maths/people/staff/stefan adams/lecturenotestvi/cdias-adams-30.pdf

[b] Stefan Adams, *Large deviations for stochastic processes*, EURANDOM reports 2012-25, (2012); available online http://www.eurandom.tue.nl/reports/2012/025-report.pdf

[c] Firas Rassoul-Agha & Timo Seppalainen, *A Course on Large Deviations with an Introduction to Gibbs Measures*, (Graduate Studies in Mathematics), American mAthematical Society (2015).

[d] Peter Friz, Jim Gatheral & Archil Gulisahvili, *Large Deviations and Asymptotic Methods in Finance*, Springer (2015)

[e] Hans-Otto Georgii, Gibbs measures and Phase Transitions, De Gruyter (1988).