

## NORBIS Course in Genetic epidemiology and genome-wide association analyses (GENSTAT-B), 30 May – 3 June 2022

The course book is «[An Introduction to Statistical Genetic Data Analysis](#),» by Melinda Mills, Nicola Barban, and Felix C. Troupf.

A bit about the authors (source: <https://www.sociogenome.org/the-team>)



**Melinda Mills**

Mills is a Professor of Demography and Director of the Leverhulme Centre for Demographic Science at the University of Oxford & Nuffield College, UK. Mills' main research areas combine a social science and genetic approach to the study of behavioral outcomes, with a focus on fertility, partnerships, and assortative mating. She earned a PhD in Demography from the University of Groningen in 2000.



**Nicola Barban**

Professor of Demography at the University of Bologna, Italy, and an international co-investigator of the ESRC Research Centre on Micro-Social Change (MiSoC). He is the principal investigator of the ERC Consolidator Grant [GENPOP: Genes, genealogies and the evolution of demographic change and social inequality](#). Barban earned a PhD in Statistical Sciences from the University of Padua, Italy. His main research interests are sociogenomics, quantitative methods in social sciences, demography, social interactions, and life course analysis.



**Felix C. Troupf**

Troupf is currently an Assistant Professor in Social Science Genetics at CREST/ENSAE, Paris, France. He was previously a Senior Research Officer on the SOCIOGENOME project. From 2011 to 2015, he was appointed as a doctoral researcher and lecturer at the ICS Graduate School, University of Groningen in the Netherlands.

## Course syllabus

In this course, we will be focusing on the following chapters in the Mills *et al.* book. These will constitute your reading assignments. Note that not all the chapters need to be read with the same level of scrutiny.

Chapters 1, 2 & 3: Primers for understanding important concepts in genetics, genetic data analysis, and human evolution.

Chapter 4: Background on GWAS and GWAMA (study design, statistical inference, methods, quality control, and public data repositories)

Chapter 5: Polygenic risk scores (detailed reading is not necessary; focus instead on understanding the underlying concepts)

Chapter 6: Gene environment interactions

Chapters 7, 8 & 9: Working with data (all these chapters lay the foundations for the practical exercises in this course)

Chapters 11, 12 & 13: Applications and advanced topics (only light reading is necessary)

Chapter 14: Ethics (it is important to understand ethical issues in human genetic research; this is covered by other courses at universities and will not be covered here. It is important, however, to read this chapter to gain a basic understanding of these important concepts).

## For those interested in going beyond the current syllabus 😊

Several courses are held in topics related to the ones being taught in this course. Some instructors have been generous in providing the contents of their past courses. If you would like to learn more about genetic epidemiology, here are some useful websites and textbooks:

Summer Institute in Social-Science Genomics: <https://www.rsfgenicsschool.com/materials>

Genetic Association Course: [https://statgen.us/Previous\\_Courses](https://statgen.us/Previous_Courses)

### Course book

