

Academic preparations

Depending on their educational background, students may want to prepare academically for one or more core sequences before they come to BDS.

Programming, math, statistics and econometrics are important building blocks for our research master Business Data Science and are considered necessary knowledge.

Students who are lacking some of this knowledge but show exceptional analytical and quantitative skills (as evidenced by their grades, GMAT or GRE scores, essays, or reference letters) are invited to fill their gaps.

You are advised to check the [admission requirements](#) and to see whether you feel comfortable with the list of suggested reading material.

List of suggested reading material

We suggest students to familiarize themselves upfront with the material of the first blocks and to fill their gaps in programming, math, statistics and econometrics by taking online courses, and/or reading some books on the following topics:

Mathematics

All incoming students are supposed to be familiar with the basics of the usual mathematics courses for undergraduate students in economics:

1. Functions of one variable: linear functions, quadratic functions, polynomial functions, power functions, exponential functions, logarithmic functions, inverse functions.
2. Differentiation: relation with tangent, rules for differentiation (including product rule, quotient rule, chain rule), linear approximation, Taylor approximation.
3. Integration: indefinite and definite integrals, primitive of a function, relation with area.
4. Linear equations: matrix and vector notation, Gaussian elimination, matrix multiplication, transpose.

Students lacking a strong mathematics background should prepare before they come to BDS, by studying the first 12 chapters of

- Anthony and Harvey (2012). *Linear Algebra: Concepts and Methods*, Cambridge University Press.

Also, students may want to enrol in the Coursera course “Logic for Economists” (<https://www.coursera.org/learn/logic-for-economists>), which has been written for prospective BDS students, and which gives a brief introduction to formal mathematical topics like propositional and predicate logic, set notation, the number system, and types of proof strategies.

Statistics/Econometrics

Students in the standard track should read Chapter 1 of the book used in this track’s first course

- John A. Rice (1995). *Mathematical Statistics and Data Analysis*, 2nd Edition, Duxbury Press, ISBN: 0-534-20934-3 or 3rd Edition (2007), ISBN: 0-534-39942-8

before the start of Statistics and Econometrics in September.

Principles of Programming in Econometrics

Before the start of the course, students are expected to have studied the initial exercise E0, also available through the website <http://personal.vu.nl/c.s.bos/ppectr.html>, and to have worked through the first set of video lectures on Canvas. They are welcomed to read through the full slide deck (see website/canvas) in advance.

Background material can be found at the websites of Kevin Sheppard, or Thomas Sargent & John Stachurski.

Details about the general programming techniques will follow in the course, but we will assume you are able to pick up the syntax during the course with relatively little help.