Get started with data science and smart services

Fundamentals of Data Science

BISS
Data science is a field with growing importance and implementation in modern business. The ability to use the scientific method together with other disciplines such as statistics, decision making and artificial intelligence leads to a steady and efficient business growth. Mastering the basics of data science and smart services is an essential skill for achieving progress and results in all kinds of areas of work. At BISS, we offer an extensive program that covers all of the key components for understanding the basics behind data science and smart services. The Fundamentals of Data Science program is an adequate preparation for your successful headstart in this interdisciplinary and challenging field.

**What’s in it for you and your organization?**
Data science is an interdisciplinary field that encompasses a number of scientific domains. To have a basic understanding of data science and smart services, it is essential to become familiar with all the essential components that together shape the whole concept. In this program, we focus on each of the nine disciplines that are not only inevitable for a good comprehension of the field, but are also a set of useful tools each by itself. Tools which will prepare you for the rapidly developing world of big data.
How can I participate?
This is an open enrollment course, which means that professionals from all kinds of backgrounds looking for general knowledge on data science and smart services are welcome to participate.

How is this program structured?
The program consists of 9 sessions distributed across 2 months. The topics of each of the sessions are listed on the next page. This program consists of 3 cycles throughout the year. Introduction to Data Science, Business Process Management and Datasafari Management are the three basic topics. It is possible to choose different sessions or take part in the full program.

The working language is English; the documentation material is also written in English.

Our way of teaching
All of our sessions are led by experts in the particular fields. The lecturers are a mix of renowned academics from Maastricht University and its network. We encourage you to exchange your thoughts, ideas, concepts and personal experiences with other professionals. We will first introduce you to the key concepts and how they impact various organizations. Later on, roles and applications, developments, critical questions, issues and insights of every topic will be covered in their respective sessions. The structure of the program is designed to inspire you to critically assess its content and work out its application in your own field.
Overview of the program

The program is comprised of nine sessions, also known as the “Full Pack”. It is also possible to choose one or more individual sessions:

→ Introduction to Data Science
→ Business Process Management
→ Datasafari Management
→ Statistical Methods
→ Data Visualization
→ Human Decision Making / Behavioral Economics
→ Artificial Intelligence
→ Social Network Analytics
→ Service Design Thinking
→ **Data Science Introduction:** Prof. Dr. Rudolf Muller introduces you to Data Science and Smart Services. Essential topics such as data analytics, business analytics and big data will be discussed, together with how they impact organizations. You will be walked through concepts such as blockchain and techruption. This session offers a preview of what you can expect to learn.

→ **Business Process Management (BPM):** In this session, Dr. Banu Aysolmaz will introduce you to the role, meaning and adjustment of business process management within organizations. This session will walk you through the algorithms used in BPM and how to work with them. Furthermore, you will get acquainted with the latest developments in the field, process mining and types of data analysis. By determine what, why and to which extent you want to analyze, you will learn to establish a useful analysis model.

→ **Data Safari Management:** In this interactive session the main focus lies on data science. From business understanding to data analysis, you will become familiar with the concept of Datasafari and learn to apply it in your business. This session by Prof. Dr. Remko Helms focuses on the added value of available data. You will learn about existing business models and strategies within the Datasafari-ecosystem.
→ **Statistical Methods:** This session introduces statistical models for data analysis. The focus will be on the most utilized statistical methods in data science, the application of statistics and available software. Business statistics yields useful insights into customer behavior and helps establish accurate models of product pricing, quality control or production planning. This session led by Dr. Nalan Bastürk will delve deeper into statistical modelling, reporting statistical results and possible limitations and problems that need to be overcome.

→ **Data Visualization:** How do you make a good visual representation of your data? And how does that give any insights to your organization? In this session, Kay Schröder presents a general overview of data visualization. From early history to modern methods, the focus lies on the basics of bringing your data on the screen together with some general key features that have to be included in a good visual representation. You will become familiar with various types of graphs, charts and plots, and learn which visualization types are the best fit for your data.

→ **Behavioral Economics / Human Decision Making:** This session by Dr. Christina Rott connects economic and game-theoretic decision-making with human psychology. You will learn about experimental economics, how humans make decisions and how decision-making changes when a certain amount of risk and uncertainty are involved. A number of models and theories will give you a good understanding of the concept of behavioral economics. This session contains fun experiments, and real-life examples and problems.
→ **Artificial Intelligence:** In this session, you will become familiar with concepts such as intelligent digital bots, voice emotion recognition, intelligent problem solving, 3D prototypes, deep learning and many more. Artificial intelligence is rapidly taking over hundreds of tasks previously operated only by humans. With business and market consistently adapting to new methods, approaches and solutions yielded by artificial intelligence, it is essential to follow the progress. In this session led by Dr. Mahdi Ebrahim, you will learn about key aspects of artificial intelligence, tools and implementation.

→ **Social Network Analysis:** How can your organization apply big data? Which analyses can be utilized and what is the impact of social media? Dr. Mark Graus will discuss key concepts in social networking and its role in business. Undirected and directed connections or simplex and multiplex networks – you will become familiar with how exactly social media links work and how this can be of advantage in creating a successful business.

→ **Service Design Thinking:** How do you develop smart services based on data? Where do you start and which process will you choose? In this session led by Dr. Dominik Mahr, the focus will be on the three pillars of Design Thinking: Design Mindset, Design Process and Design Tools. Learn to incorporate the interplay between customer perspective and business perspective in your own organization to achieve the results that you strive for.
# Agenda Fundamentals of Data Science 2019*

## cycle 1

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>7-2-2019</td>
<td>Data Science Introduction</td>
</tr>
<tr>
<td>Tuesday</td>
<td>12-2-2019</td>
<td>Business Process Management</td>
</tr>
<tr>
<td>Thursday</td>
<td>21-2-2019</td>
<td>Datasafari Management</td>
</tr>
<tr>
<td>Thursday</td>
<td>14-3-2019</td>
<td>Statistical Methods</td>
</tr>
<tr>
<td>Thursday</td>
<td>21-3-2019</td>
<td>Data Visualization</td>
</tr>
<tr>
<td>Thursday</td>
<td>28-3-2019</td>
<td>Human Decision Making / Behavioral Economics</td>
</tr>
<tr>
<td>Thursday</td>
<td>4-4-2019</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>Thursday</td>
<td>11-4-2019</td>
<td>Social Network Analytics</td>
</tr>
<tr>
<td>Thursday</td>
<td>18-4-2019</td>
<td>Service Design Thinking</td>
</tr>
</tbody>
</table>

## cycle 2

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>16-5-2019</td>
<td>Data Science Introduction</td>
</tr>
<tr>
<td>Tuesday</td>
<td>21-5-2019</td>
<td>Business Process Management</td>
</tr>
<tr>
<td>Thursday</td>
<td>28-5-2019</td>
<td>Datasafari Management</td>
</tr>
<tr>
<td>Thursday</td>
<td>6-6-2019</td>
<td>Statistical Methods</td>
</tr>
<tr>
<td>Thursday</td>
<td>13-6-2019</td>
<td>Data Visualization</td>
</tr>
<tr>
<td>Thursday</td>
<td>13-6-2019</td>
<td>Social Network Analytics</td>
</tr>
<tr>
<td>Thursday</td>
<td>20-6-2019</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>Thursday</td>
<td>27-6-2019</td>
<td>Human Decision Making / Behavioral Economics</td>
</tr>
<tr>
<td>Thursday</td>
<td>4-7-2019</td>
<td>Service Design Thinking</td>
</tr>
</tbody>
</table>
*Please note that the dates might change. You can find the most up-to-date schedule at: https://www.biss-institute.com/education/fundamentals-of-data-science/.*

Most sessions run from 10:00 to 13:00. First day introduction starts at 9:30.
Useful information

**Location**
BISS
Brightlands Smart Services Campus
Smedestraat 2, 6411 CR Heerlen

**Participation rates**
Participation in the entire program:
→ €1.795 for partners
→ €1.995 for others

Participation in single sessions:
→ €195 for partners
→ €220 for others

* Rate is VAT exempt.
** Documentation material and catering are included.

**Payment conditions**
As participants must pay an upfront fee for the program, we kindly ask you to fill in the payment details on the registration form. After we have received your completed registration form, we will send you a confirmation of participation and an invoice.

**Registration**
If you wish to take part in the full program or to follow just one single session, please complete the registration form. We will then contact you as soon as possible.

**Contact**
BISS
Brightlands Smart Services Campus
6411 CR Heerlen
E-mail: biss@brightlands.com
Tel.: +31 (0)6 3656 0941
www.biss-institute.com/education