

Workshop

Introduction to Machine Learning

Organizational details

Instructor:	Dr Tobias Keller
Dates:	October 26 – 28, and November 10 – 11, 2026 9.00 am – 2.30 pm respectively
Venue:	Room 30 (PC-Pool), Licher Str. 68, 35394 Giessen
ECTS:	4 ECTS
Max. participants:	12

Objectives

After this workshop, participants understand the basic concepts and typical process of machine learning and how it enables artificial intelligence systems. On the basis of examples from practice and research, participants will learn to think like data scientists, and to ask the right questions. They will also learn to apply and evaluate algorithms for supervised and unsupervised machine learning tasks using the open source software KNIME, which does not require programming knowledge. Since there will be no need to learn a programming language during the course, more time will be allocated to understanding the algorithms on an intuitive, non-formal level.

Content and methods

The course consists of lectures to build the theoretical background as well as hands-on tutorials and exercises using the machine learning software KNIME. Participants will learn by examples and exercises from the instructor's experience in research and practice.

Hands-on tutorials and exercises will make up about 40 per cent of the course time. Students will complete those using their own computers. Please see the preparation requirements below for a list of software that needs to be installed to that end. The exercises will be based on exemplary datasets that will be provided to the participants before the course.

Structure

1. Introduction
2. Definitions and Examples from Practice
3. The Machine Learning & Data Science Process
4. Introducing the Case Study and KNIME
5. Supervised Learning: Classification
6. Supervised Learning: Regression
7. Evaluating Machine Learning Models
8. Unsupervised Learning: Clustering
9. Unsupervised Learning: Dimensionality Reduction
10. Neural Networks / Deep Learning

To gain the ECTS credit points participants have to:

- Download and install the open source software KNIME, which is free to use:
<https://www.knime.com/downloads>
- Download and extract the course material and exemplary datasets that will be provided in time before the course.
- Actively participate during the workshop

Target group

Doctoral candidates or postdoctoral researchers doing empirical research or intending to work as data scientists.

Course language

English (German, if only German participants)

Please note: As this is not an English language course proficiency in English at the C1 level of competency is required.

About the Instructor

Dr Tobias Keller has been working as data scientist at ZERO.ONE.DATA, the big data startup of Deutsche Bahn AG since 2016. He consults on and applies machine learning and statistics for artificial intelligence systems in a big data environment. Furthermore, he teaches data science at Deutsche Bahn, in the doctoral education programmes at Justus Liebig University Giessen, and in the doctoral programme and master programme at WHU – Otto Beisheim School of Management. His research interests include machine learning and artificial intelligence, finance and accounting, strategic management.

Registration

By October 16, 2026 via e-mail at info@ggs.uni-giessen.de.