

Course Curriculum Details

Course title	Digital Twins in Dairy Learning -Dairy school Malente
Course co-ordinator	Anne Nadolny
Instructors	Lars Martens-Pieper Meike von Bergen Jan-Peter Meyer
Course description (min 200 words)	This course presents four digital twins being used in the LVZM. The real plant on site in the technical facility is also integrated for comparison with the digital twins. Digital twins for plate heat exchangers, separators, and the technical facility “operating room of a dairy plant” are presented, and scenarios involving the digital twin “raw material planning” of an industrial plant are presented and explained. Interactive elements accompany the knowledge building process, in which quizzes, word insertion, and other methods enable independent practice after each section, including feedback on correct/incorrect answers. The aim is to give students an overview of the possibilities of using digital twins for learning. Digital twins enable many repetitions of the structure of plants and plant components, such as the separator, and can facilitate work on the real plant or component at a later stage. The digital twins thus help students gain confidence in handling the plants and components. In addition, they learn the connections between digital twins and real-world systems so that they can draw their own conclusions. For example, they can use the scenarios for training purposes, to try out optimizations, and to discover sources of error. In terms of accessibility, the course offers the option of displaying the text alongside the spoken word so that it can be read, as well as having the text read aloud.
Target audience	EQF 4

Learning outcomes/objectives	By the end for the course, learners will be able to, - describe the connections within the short-time pasteurization system and the separator. - explain the technical facility and understand its connection to the digital twins. - use the digital twin of the plant as a tool to identify the effects of changing parameters. - identify the applications of digital twins in industrial production.
Assessment and grading methods (e.g. knowledge check, MCQ, Written reflection on course impact to your job)	The knowledge acquired will be assessed through various exercises, e.g. knowledge check, multiple choice questions, learning card, drag and drop option, quizzes during and at the end of each section as well as a case study at the end of the course.

Course Schedule				
Session number / order	Description	Format	Duration	Instructor
1.1	Introduction – How to start	Animated module including audios and videos +Quiz	30min	Anne Nadolny
1.2	Introduction “Digital Twin”	Video + Quiz	30min	Anne Nadolny
3	Introduction to technical facility	Video + Quizzes	2h	Jan-Peter Meyer, Meike v. Bergen
4	Digital Twin- “Plate heat exchanger”	Videos +interactive learning material	2h	Lars Martens-Pieper,
5	Digital Twin- “Separator”	Videos +interactive learning material	2h	Lars Martens-Pieper
6.1	Digital Twin “technical facility”, Control and operating panel, symbols	Video and interactive learning material	2h	Lars Martens-Pieper

6.2	Digital Twin technical facility, use of digital twin	Interactive actions e.g. try out changes in process flow e.g. temperature failure, + learning material	2h	Lars Martens-Pieper
7.	Digital twin "raw milk reception" industry	scenarios + interactivities e.g. quizzes	4h	Rainer Andresen, Anne
8.	Summary and Final Quiz	Video and Final interactivity	1h	Lars Martens-Pieper
			Total 16h	

Comments: