**Valid from** 2024.HS

# Module description: Physik 3: Factory Physics

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| **Module Code** | t.BA.WIP.FAP.19HS |
| **ECTS Credits** | 4 |
| **Language of Instruction/Examination** | German |
| **Organizational Unit** | IDP |
| **Module Coordinator** | Stephan Bütikofer |
| **Legal Framework** | The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail. |
| **Module Characteristic** | Type 2a<br><br>4 consecutive lecture lessons per semester week and class |
| **Module Description** | The Factory Physics module focuses on the dynamics of operational processes. The course analyses the various sources of variability in operational processes. For the mathematical description of these processes, models from queueing theory are used. The models are illustrated with practical examples. |
| **Module Content** | • The description and modelling of the dynamics of operational processes are the focus of this course. The different sources of variability in operational processes are analyzed. For the mathematical description of the processes models from the queueing theory are used. The models are illustrated with selected practical examples.<br>• The module is structured as follows:<br>• Introduction to dynamics of operational processes<br>• Performance indicators and variability in operational processes<br>• Queuing systems M/M/c and G/G/c, with/without priority rules; exact, analytical formulas and approximation formulas<br>• Possibilities and limits of modeling with queues<br>• Queuing systems with multiple products<br>• Approaches to the reduction of variability<br>• Selected case studies |
| **Prerequisite Knowledge** | |
| **Learning Objectives (Competences)** | |

| Students... | Competencies | Taxonomies |
|---|---|---|
| Understand how variability affects the key performance indicators of an operational process | F, M | K2, K4 |
| Use queuing models for case studies | SE, M | K3, K4, K5, K6 |
| Describe queuing systems with analytically solvable, stochastic models | F | K3 |

**Performance Assessment**

| End-of-module exam | Assessment | Length (min.) | Weighting | Form |
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| oral exam | Grade | 30 | 100 | |

| Performance assessment during the semester | Assessment | Length (min.) | Weighting | Form |
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| **Classroom Attendance Requirement** | None |
| **Learning material** | • Presentation Slides, notes on blackboard |
| **Comments** | |