

Module: Process Optimization

Level	Master	Short Name	POPT
Responsible Lecturers	Töbermann, J.-Christian, Prof. Dr.-Ing		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Applied Information Technology, Master		
Compulsory/elective	Compulsory elective	ECTS Credit Points	5
Semester of Studies	2	Semester Hours per Week	4
Length (semesters)	1	Workload (hours)	150
Frequency	WiSe	Presence Hours	60
Teaching Language	English	Self-Study Hours	90

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Project Work	Exam Language	English
Exam Length (minutes)		Exam Grading System	One-third Grades
Learning Outcomes	The Students: <ul style="list-style-type: none"> • can apply various mathematical and heuristic optimization methods and know their fields of application and limitations. • can apply basic approaches of AI-based optimization. • can systematically plan and describe requirements for higher decision and optimization functions in automation systems or superimposed operating systems (e.g. Manufacturing Execution Systems). • can implement such functions using suitable optimization methods and integrate them into the overall system. 		
Participation Prerequisites			

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	✓ Use of gender-neutral language (THL standard) ✓ Target group specific adjustment of didactic methods ✗ Making subject diversity visible (female researchers, cultures etc.)
Applicability	
Remarks	

Module Course: Process Optimization (Lecture)

(of Module: Process Optimization)

Course Type	Lecture	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	3
Participation Limit		Semester Hours per Week	3
Group Size		Workload (hours)	90
Teaching Language	English	Presence Hours	45
Study Achievements ("Studienleistung", SL)		Self-Study Hours	45
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	<ul style="list-style-type: none"> • Mathematical and heuristic optimization methods. • Basics of AI-based optimization methods. • Modelling of process tasks for higher decision and optimization functions and selection of suitable methods, approaches, and algorithms. • Design, implementation, simulation and testing of higher decision and optimization functions. • Integration into existing Automation Systems or Manufacturing Execution Systems.
Literature	Literature will be named in the lecture.
Remarks	

Module Course: Process Optimization (Practical Training)

(of Module: Process Optimization)

Course Type	Practical Training	Form of Learning	Presence
Mandatory Attendance	yes	ECTS Credit Points	2
Participation Limit		Semester Hours per Week	1
Group Size	12	Workload (hours)	60
Teaching Language	English	Presence Hours	15
Study Achievements ("Studienleistung", SL)	Practical Training	Self-Study Hours	45
SL Length (minutes)		SL Grading System	Pass

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	In the practical trainings during the semester, the students apply what they have learned in the lecture to given or self-study topics for selected application scenarios.
Literature	See lecture.
Remarks	