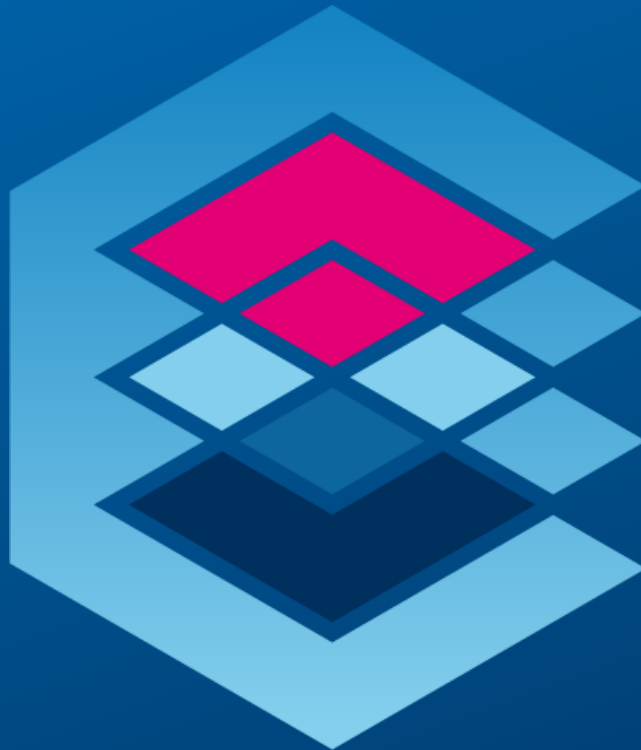




Deutsche Telekom Chair of Communication Networks
Technische Universität Dresden

Professor Dr.-Ing. Dr. h.c. Frank H.P. Fitzek

Software Engineering

Winter Semester 2026/2027



Introduction to Course Software Engineering

Software Engineering Grundlagen

“The only way to learn a programming language is to write programs in it.”

Bjarne Stroustrup

Diese Lehrveranstaltung führt durch aktives Mitmachen in die Programmierung ein. Die Studierenden bringen zu jeder Vorlesung ihren eigenen Laptop mit und schreiben während der Veranstaltung selbst Python-Code. Im Mittelpunkt stehen das Lernen durch Ausprobieren, das Entwickeln eigener Ideen, das Lösen von Problemen und die Freude am Programmieren. Schritt für Schritt entstehen dabei zunehmend komplexe Software- und Hardwareanwendungen.

Course in OPAL

At a glance

Module Number: Eul-ET-C-SwEgG

Type: compulsory course

Semester: 1th Semester ET

Term: annually in winter semester

Language: German (material in English)

Extent: 2/1/1

Exam: written, 120 min

Credits: 5

Lecturers and Teaching Assistants



Prof. Dr.-Ing. Dr. h.c. Frank
H. P. Fitzek

Head of the Chair



Dr.-Ing. Stanislav
Mudrievski

Postdoctoral Researcher, Lecturer



M.Sc. Fatima Rani

PhD Researcher



Dipl.-Ing. Nico vom Hofe

PhD Researcher

Introduction to Course Software Engineering

Time Table		open legend
15/10/2026 09:20 – 10:50	L0 – Software Installation Prof. Frank Fitzek	ABS/0E11/H
22/10/2026 09:20 – 10:50	L1 – Einführung Software Engineering / Das erste eigene Programm Prof. Frank Fitzek	ABS/0E11/H
28/10/2026 14:50 – 16:20	E1 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
29/10/2026 09:20 – 10:50	L2 – Variablen, Zahlen und Berechnungen Prof. Frank Fitzek	ABS/0E11/H
04/11/2026 14:50 – 16:20	E2 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
05/11/2026 9:20 – 10:50	L3 – Entscheidungen und boolesche Logik Prof. Frank Fitzek	ABS/0E11/H
11/11/2026 14:50 – 16:20	E3 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
12/11/2026 9:20 – 10:50	L4 – Schleifen, Muster und Simulationen Prof. Frank Fitzek	ABS/0E11/H
18/11/2026	No exercise – Public holiday	
19/11/2026	No lecture – Project week	ABS/0E11/H
25/11/2026 14:50 – 16:20	E4 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
24/11/2026 9:20 – 10:50	L5 – Funktionen und modulare Programmierung Prof. Frank Fitzek	ABS/0E11/H
02/12/2026 14:50 – 16:20	E5 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	

03/12/2026 9:20 – 10:50	L6 – Listen, Mengen, Dictionaries und Dateien Prof. Frank Fitzek	ABS/0E11/H
09/12/2026 14:50 – 16:20	E6 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
10/12/2026 9:20 – 10:50	L7 – Algorithmen, Big O und Sortierverfahren Prof. Frank Fitzek	ABS/0E11/H
16/12/2026 14:50 – 16:20	E7 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
17/12/2026 9:20 – 10:50	L8 – Rekursion und Zufallsexperimente Dr. Stanislav Mudrievski	ABS/0E11/H
06/01/2027 14:50 – 16:20	E8 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
07/01/2027 9:20 – 10:50	L9 – Programmieren der physischen Welt Dr. Stanislav Mudrievski	ABS/0E11/H
13/01/2027 14:50 – 16:20	E9 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
14/01/2027 9:20 – 10:50	L10 – Sensoren, PWM, Interrupts und Kommunikation Nico vom Hofe	ABS/0E11/H
20/01/2027 14:50 – 16:20	E10 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
21/01/2027 9:20 – 10:50	L11 – Von Logikgattern zur Binäraddition Nico vom Hofe	ABS/0E11/H
27/01/2027 14:50 – 16:20	E11 Dr. Stanislav Mudrievski, Fatima Rani, Nico vom Hofe	
28/01/2027 9:20 – 10:50	L12 – Von Software zum 8-Bit-Computer Prof. Frank Fitzek	ABS/0E11/H

OPAL

- Bitte alle Studenten in OPAL eintragen
- Link steht auf der Webseite
- Wir benutzen OPAL
 - um mit den Studenten im Kontakt zu bleiben
 - Materialien
- Jeder Student im OPAL bekommt einen eigenen Raspberry Pi Pico plus Hardware

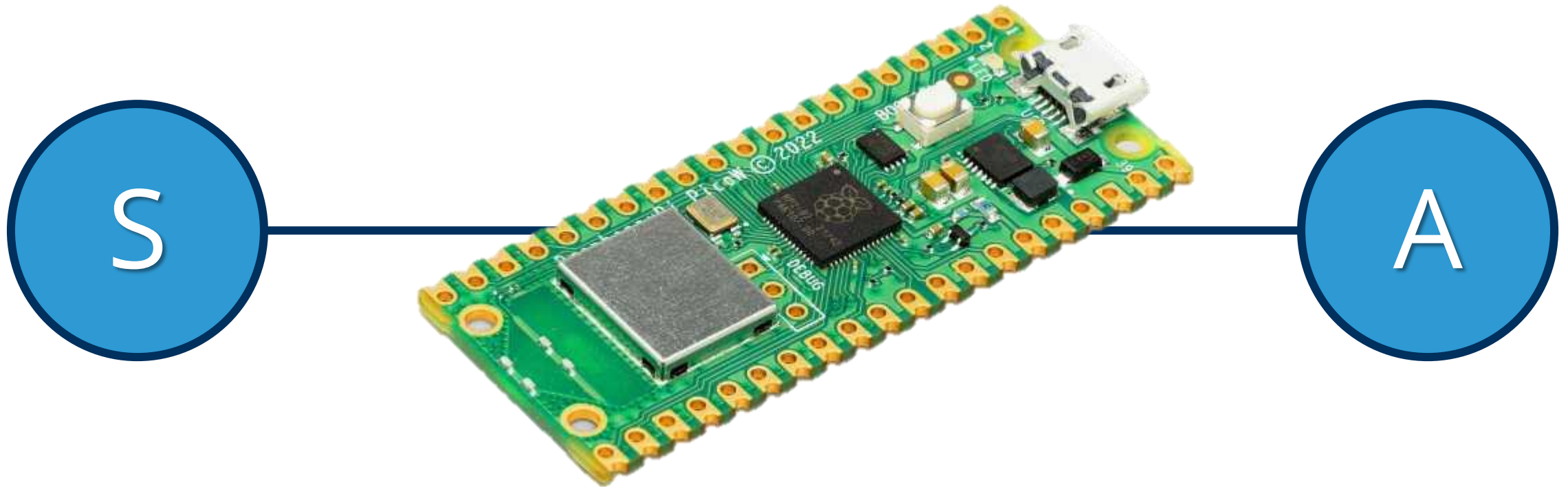
Goal of the Lecture

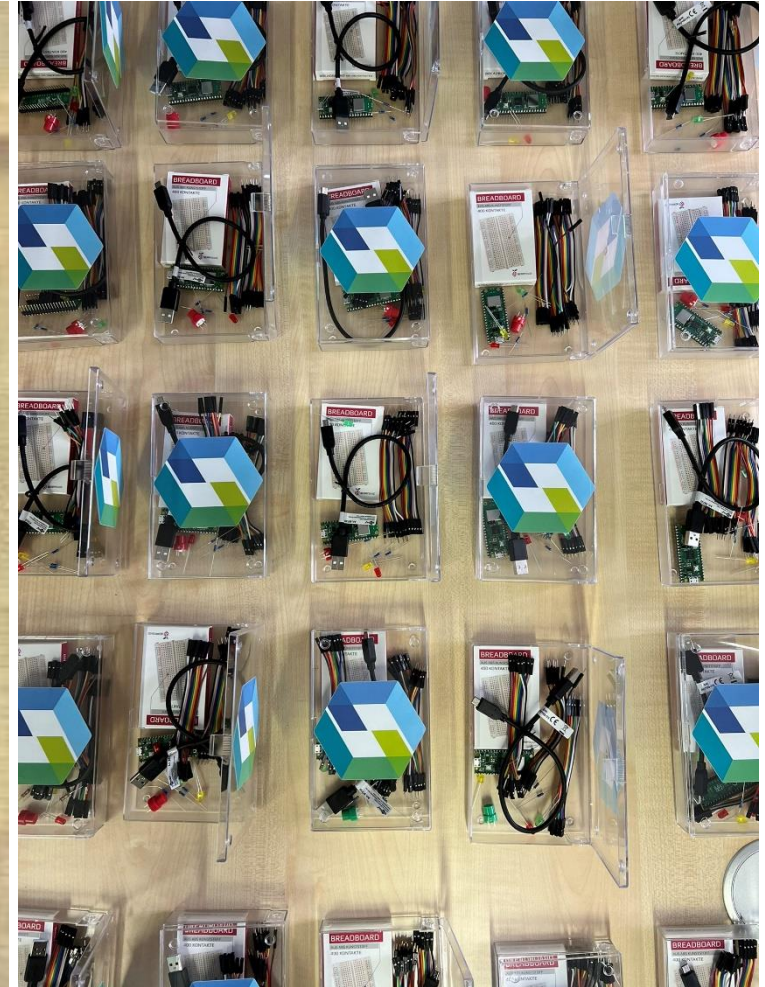
Basic Programming	Algorithms and Complexity	Programming of Embedded Devices	Computer Hardware and Fundamentals
<i>(You will learn to program!)</i>	<i>(You will learn to program <u>efficiently</u>!)</i>	<i>(You will learn to interact with the outer world!)</i>	<i>(You will learn where your programs run!)</i>
Installation of IDE	Coupon Collectors's Problem	Introduction to Raspberry Pi Pico	Computer Architecture Turing vs. Von Neumann
Loops and Conditionals	Fibonacci, Recursion	UDP Communication over WiFi	Halting Problem
I/O	Bubble Sort	Practical examples in MicroPython for Raspberry Pi Pico	Transistor → Logic gate → 4-bit adder → 8-bit breadboard
Basic: binary, logic, etc.	Pointers	Raspberry Pi Pico architecture 1	
		Raspberry Pi Pico architecture 2	
		Raspberry Pi Pico architecture 3	

Programming Language

- Python
- MicroPython
- Problem Based Learning
- Praktikum / Labs
 - More info in our meetings and web pages

Was bedeutet das für die Vorlesung?



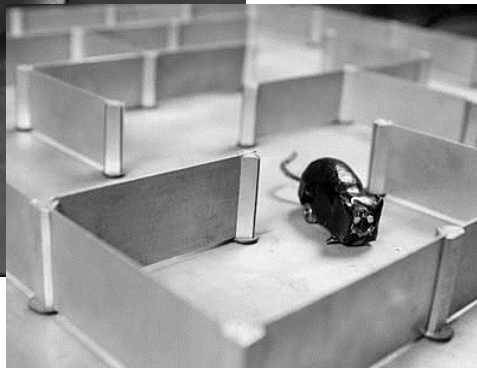


Python (2 Vorlesungstermine)

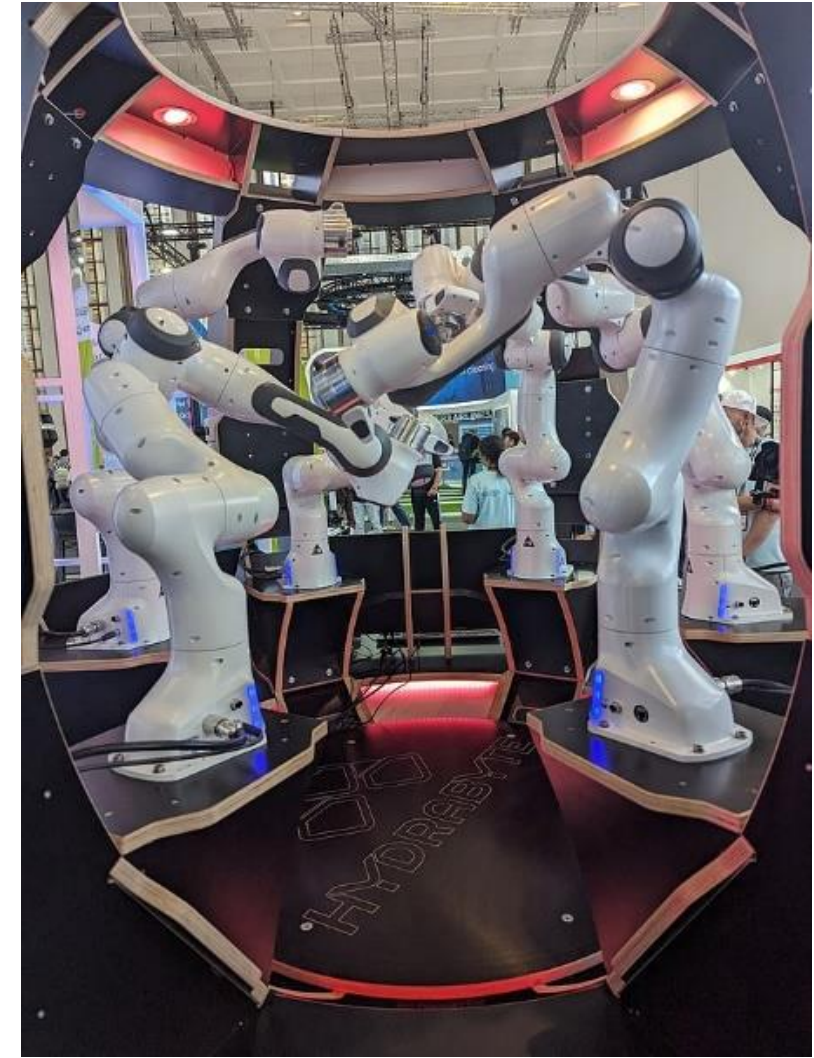
- 1 Vorlesung “Fun with Frank & Juan” – Panini Album
- 1 Vorlesung “CeTI with Frank & Juan”
- Studenten brauchen eine Python Programmierumgebung
 - Installation am 15.10.
 - <https://www.programiz.com/python-programming/online-compiler/>
 - <https://jupyter.org/try-jupyter/lab/>
 - Whatever works
- Eigenen Rechner mitbringen (wichtig!!!)



Claude Shannon



Robotics



Boston: Northeastern University and Boston Dynamics

