

# VGU VIETNAMESE-GERMAN UNIVERSITY (VGU)



Vietnamese Creativity



German Quality



Universal Opportunities

## Welcome to VGU

Prof. Dr.-Ing. Tomas Benz

# VGU Mission

VGU is a **public** Vietnamese University developed in close **partnership with Germany.**

VGU principles are **academic freedom, unity of teaching and research, and institutional autonomy.**

VGU aims at **excellence in research, education and training** in the fields of **engineering, IT and economics.**

Our graduates combine **theoretical knowledge** with **critical thinking** skills to creatively **solve practical problems.**

VGU acts as a driver of the **economic, social and technological development of Vietnam** in core economic areas.

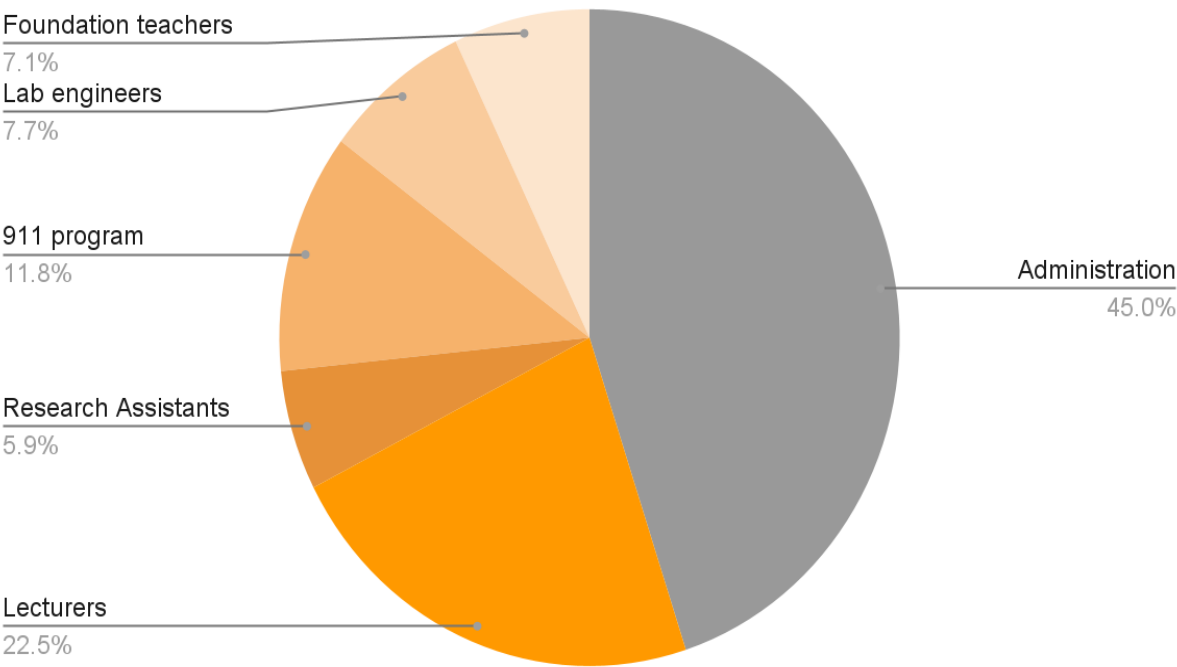




VGU New Campus in Ben Cat  
– a 165 million USD investment funded by the World Bank.

# VGU Human Resources

## VGU employees per category



Total headcount: 170



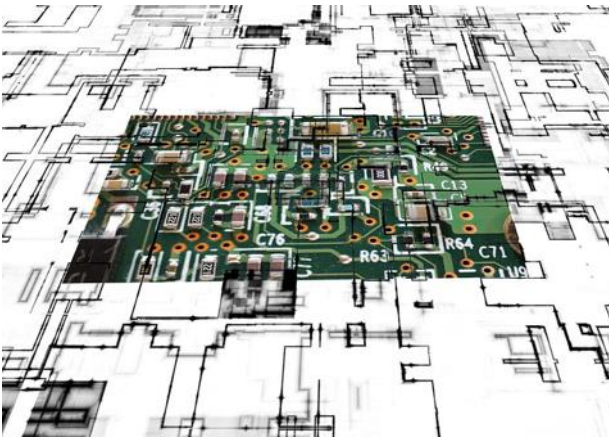
Lecturers with PhD and main degree obtained abroad

# VGU Study Programs Portfolio as of 2022

	PRODUCTION ENGINEERING	URBAN ENGINEERING	DIGITAL ENGINEERING	ECONOMICS AND MANAGEMENT
<b>Bachelor</b> 01 foundation year: review of basic knowledge and english language skills	<b>Mechanical Engineering (MEN)</b> Ruhr University of Bochum	<b>Civil Engineering (BCE)</b> Biberach University of Applied Sciences	<b>Computer Science (CSE)</b> Frankfurt University of Applied Sciences	<b>Finance and Accounting (BFA)</b> Goethe University of Frankfurt
	<b>Electrical and Computer Engineering (ECE)</b> Frankfurt University of Applied Sciences	<b>Architecture (ARC)</b> Anhalt University of Applied Sciences		<b>Business Administration (BBA)</b> Goethe University of Frankfurt
<b>Master</b>	<b>Global Production Engineering &amp; Management (GPE)</b> Technical University of Berlin	<b>Water Technology, Reuse and Management (WTE)</b> Technical University of Darmstadt	<b>Business Information Systems (BIS)</b> Heilbronn University of Applied Sciences	<b>Master of Business Administration (MBA)</b> University of Leipzig Heilbronn University of Applied Sciences
	<b>Mechatronics and Sensor Systems Technology (MST)</b> Karlsruhe University of Applied Sciences	<b>Sustainable Urban Development (SUD)</b> Technical University of Darmstadt	<b>Computational Engineering (COM)</b> Ruhr University of Bochum	<b>Global Finance and Economics (GFE)</b> Goethe University of Frankfurt
			<b>IT Security (ITS)</b> Darmstadt University of Applied Sciences	
<b>Doctor</b>	<b>Precision / Sustainable Manufacturing 4.0</b>	<b>Traffic and Transport, Sustainable Cities</b>	<b>Digitalisation, IT Security, Simulation</b>	



# Research: VGU Focus on Digitalization and Sustainability



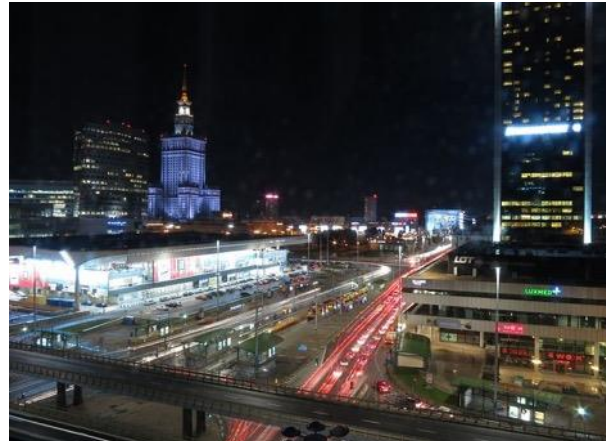
## Electrical Engineering

- Electrical Measurement & Control
- Electronics & Radiofrequency Engineering
- Communications & Digital Systems
- Smart Grids



## Sustainable Production

- Smart Materials
- Precision Manufacturing
- Sensor Systems
- Smart Automation Systems



## Smart Urban systems

- Architecture and Urban Planning
- Structural Engineering
- Water and Environment
- Traffic and Transport



## Information Technology

- Machine Learning and Artificial Intelligence
- Computer and Software Engineering
- Big Data
- Cyber Security

# Research Cooperation

- Projects Funded by German Government
  - With German public agencies
  - With German universities (single partners)
  - With German, international and Vietnamese universities (consortium)
- Projects Funded by EU
  - With a consortium of EU and international universities and research centres



# Research Cooperation with Germany

- "Renewable building materials and their applications in Vietnam"
- Partner: DENA – German Agency for Energy and Sustainability
- Sponsor: Consulate General HCMC/ Ministry of Foreign Affairs





# Research Cooperation with Germany

- HHN-INVEST-PRO<sup>3</sup>  
Driving simulator VR environment
- Partner: UniTyLab - Heilbronn  
University and VGTRC - VGU
- Sponsor: DAAD, HAW.International



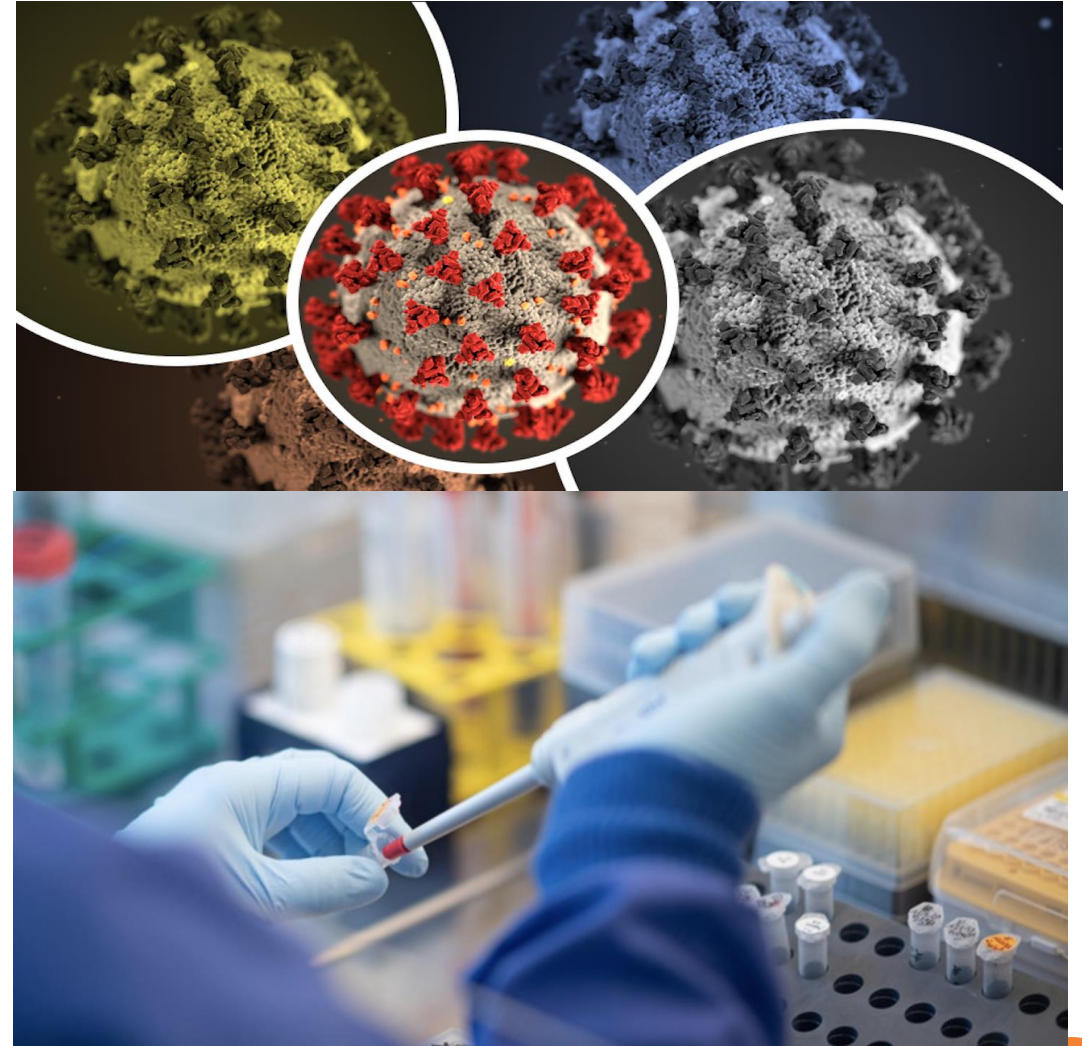
# Research Cooperation with Germany

- PAN ASEAN Coalition for Epidemic and Outbreak Preparedness (PACE-UP)
- Partner: University Tübingen, Vietnamese-German Centre for Medical Research (VG-CARE) Hanoi, VGU
- Sponsor: German Ministry of Foreign Affairs , DAAD



# Research Cooperation with Germany

- Abwa-SARS; Virus DNA Detection in Waste Water
- Partner: iwar - TU Darmstadt, Water Technology, Reuse and Management (WTE) VGU
- Sponsor: Hessian Ministry of Economic Affairs and Federal Ministry for Economic Cooperation and Development (BMZ), GIZ





# EU Research Cooperation and Capacity Building

- Developing Energy Efficient and Smart Lighting Education in Vietnam & Myanmar
- Partner: Aalto University (Finland), Eindhoven Technology University (the Netherlands), University of Ljubljana (Slovenia), VGU
- Sponsor: ERASMUS+ (EACEA)







# Thank you!

Prof. Dr.-Ing. Tomas Benz

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# Electrical Engineering: Equipment

## Electrical Measurement & Control



### Electrical Metrology

- Interface with virtual instruments
- Experimenter
- Measurement accessories



### Experimental Physics

- Ultra-Sonic Unit
- High Current Power Supply for Magnetic field Experiment
- Helium laser linear polarized for Light interference experiment



### Control & Automation

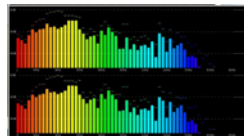
- Control theory experiment setups
- Listing/Heel Control System
- Programmable Logic Controller systems (PLCs)
- Collaborative Robot arm
- CUDA workstation

## Electronics & Radiofrequency Engineering



### Electronics

- ZVA Vector Network Analyzer
- Pick and place machine
- Reflow oven
- Paste through-hole plating
- CNC machine for drilling PCB
- ProMask & ProLegend
- Soldering workstation



### Radiofrequency

- Power supplies
- Spectrum analyzers
- Signal analyzer
- Electronic load
- Frequency response analyzer
- Resistor decade box
- Programmable LCR Bridge
- Load-pull system
- Frequency counter
- AC power source
- Power analyzer

## Communications & Digital Systems



### Communications

- Bus-Powered Multifunction DAQ
- COM3LAB system
- Thermal, HyperSpectral, Multispectral Cameras
- Dual GPS receivers, RTK GPS
- Photogrammetry
- Drone mapping software
- UAV Unmanned Aerial Vehicle Fixed Wing



### Digital circuit design

- Starter kit and development system for the 8-bit and 32-bit AVR microcontrollers;
- Evaluation kit with a 32-bit AVR UC microcontroller
- Touch Dev Kit with an ATiny88
- Electronic Design Automation
- Field Programmable Gate Array (FPGA) development kits
- Electronic Design Automation (EDA) software.

## Power Engineering & Smart Grids

- Power Quality and Energy/Motor Analyzer
- Protection, Automation, and Bay Control System
- Arc-Flash Test Module
- Dual Universal Overcurrent Relay
- Protection, Automation, and Control System & Merging Unit
- High-Speed Remote I/O Module (Communications Processor)
- Real-Time Automation Controller (RTAC)
- Traveling-Wave Test System
- Satellite-Synchronized Clock
- Solar Micro Inverter Development Kit
- Grid-tied photovoltaic (PV) inverter
- High voltage solar developers kit
- Solar Explorer Development Kit
- Power Electronics Development Modules
- DC/DC Converter Package
- Real Time Digital Simulator (RTDS)



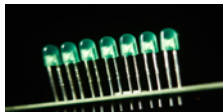
# Sustainable Production: Equipment

## Smart Materials



### Polymer materials

- Differential scanning calorimetry
- Thermal gravimetric analysis
- Fourier infrared spectroscopy



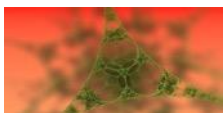
### Electronic materials

- Microlithography, Nanolithography
- Optical microscopy
- Oxygen Plasma cleaner



### Optical materials

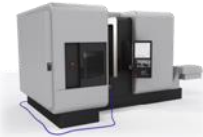
- Batop Spectrometer
- BET Surface Area Analyzers
- X-ray diffractometers



### Mechanical materials

- Ultrasonic Testing & Flaw Detector
- Laser sensor and vibrometer
- Light microscope & interferometer
- Electromechanical testing

## Precision Manufacturing



### Machining Center

- Milling and Turning Machine Center
- Injection Molding M/C
- Flat/profile & cylindrical grinding M/C
- Super Finishing Machine



### Non-Conventional Machining

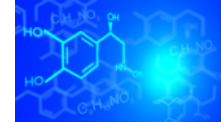
- Electrochemical (ECM)
- Wire & Sinker Electro-Discharge (EDM)
- Sheet-metal processing (laser cutting, punching, bending and marking)
- Metal and plastic additive manufacturing



### Metrology & Metallurgy

- Coordinate Measurement (CMM)
- Thermograph camera and measuring
- Metallurgy testing
- Cutting force Testing device

## Sensor Systems



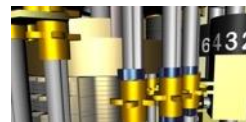
### Chemical Analytics

- Environmental Engineering
- Physical, chemical layers of sensor technology



### Analog & Digital Automation

- Signal processing
- Analog and digital hardware design
- Festo Automation work station
- FPGA development board
- Flex Devel development kit



### Simulation

- Festo Automation work station
- FPGA development board
- Flex Devel development kit

## Smart Automation Systems



### Industry 4.0 Testbed

- IoT 4.0 Platform system
- Control Cabinet IoT Gateway
- Industrial robot arm



### Smart factory management

- Quality assurance software Q-DAS
- System Infrared touch probe
- NC Gage Basic System



### Smart vehicles

- Smart monitoring system
- Roll-to-roll web system
- Pendulum system



### Lean Manufacturing

- Lean Learning Factory
- Smart workstation

# Smart Urban Systems: Equipment

## Architecture & Urban Planning



### Building materials

- gradation of aggregate, cement and mortar
- bitumen and asphalt
- soil mechanics
- geotechnical engineering
- universal testing machine



### Building Info. Modelling (BIM)

- Virtual Reality (PC & Phone)
- Mixed Reality Headset
- Augmented Reality (AR) system
- 3D Laser scanners



### Architecture studio

- A0 Printer (color and BW)
- Air Jitterbug / Belt /Randone Orbit sander
- Die grinder
- Light system

## Structural Mechanics



### Soil Mechanics

- Extruder and soil lathe
- Speedy Moisture Tester
- Particle size analysis set
- Cone Pyknometer
- Proctor rammer



### Geotechnical Engineering

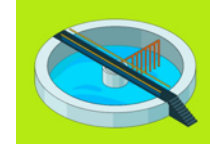
- Consolidation Apparatus set
- Constant Head permeability
- Automatic triaxial tests system
- Direct / Residual Shear Test Set
- BET Surface Area Analyzer



### Thermodynamics

- Rheometer Discovery HR3
- Air compressor
- Fluid Chiller
- Uninterruptible power supply

## Water and Environment



### Water Environmental Technology

- pH/ion measurement
- Laboratory membrane test
- Membrane Bioreactor Pilot
- RO filtration



### Water Analysis & Hydrology

- Ion Chromatography
- UV-VIS Spectrophotometer
- High-Resolution Continuum Source Atomic Absorption Spectrometer
- UV-VIS spectrophotometer
- Gas Chromatography – Quadrupole Mass Spectrometry
- Liquid Chromatography - Mass Spectroscopy
- Multibeam Echosounder system
- Multichannel Potentiostat / Galvanostat

## Traffic and Transport



### Transport planning

- Traffic Simulation VISSIM
- Traffic Planning VISUM
- Traffic Engineering VISTRO
- Analysis Software N-Logit
- Geographic Information System Arc-GIS
- Logistic systems analysis Flexterm
- General Algebraic Modeling System



### Road safety and behavior

- Crash simulator
- Motorbike Driving Simulator
- Eye-tracking device ETVision from Argus Science
- GPS Device
- CUBE Hybrid electric cargo bike