

# Network meeting Mechatronics and Artificial Intelligence Engineering

## Academic Exchange Update

24.06.2021

TOP 1	Updates from GJU: faculty and staff exchange, statistics and research interests <i>Dr. Sahar Qadan (exchange coordinator) (15 min)</i>
TOP 2	New directions in Curricula development Digitalization, Online-Teaching, E-Learning tools <i>Dr. Mutaz M. Ryalat (vice dean SATS) (10 min)</i>
TOP 3	New study plans -Artificial intelligence added to the mechatronics engineering ( <i>Dr. Sahar Qadan (10 min)</i> ) -Focus on industry 4.0 and IOT (in addition to AI) and the new labs that we plan to build: Microcontroller and IOT and The Industry 4.0 Labs <i>Dr. Hisham ElMoaqet (head of Mechatronics Department) (10 min)</i>
TOP 4	Nano research lab and externally funded research projects (Erasmus+ and RAENG) <i>Dr. Hani Mushen (10 min)</i>
TOP 5	Accreditation <i>Dr. Mariam Wajdi Ibrahim (10 min)</i>
TOP 6	Alumni student presentation <i>Ahmad Nadi and Abdullah Al-Hatem (10 min)</i>
TOP 7	Open discussion on joint future projects

# German-Jordanian University (GJU)

## A bi-national University of Applied Sciences in the Middle East



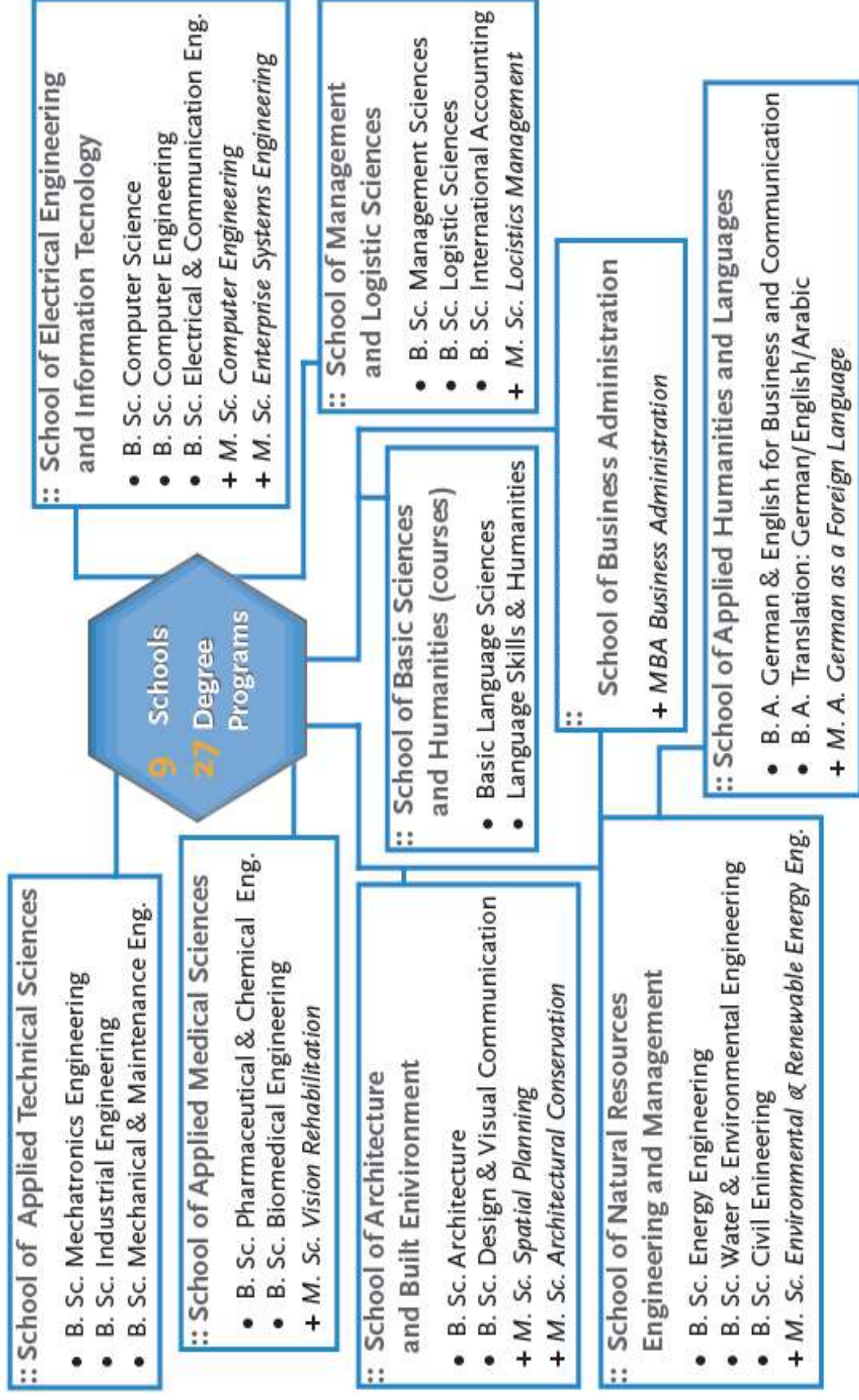
Oct. 2012 new campus opening



May 2018 Angela Merkel visit to GJU



# Currently, 28 Academic Programs in 9 Schools



# SATS Programs



# Bachelor of Science in Mechatronics and Artificial Intelligence Engineering

## Framework for B.Sc. Degree (Semester Credits)

Classification	Credit Hours			ECTS		
	Compulsory	Elective	Total	Compulsory	Elective	Total
University Requirements	21	6	27	31	6	37
School Requirements	43	-	43	72	-	72
Program Requirements	91	12	103	171	20	191
<b>Total</b>	<b>155</b>	<b>18</b>	<b>173</b>	<b>274</b>	<b>26</b>	<b>300</b>

# Bachelor of Science in Mechatronics and Artificial Intelligence Engineering

## 3.1. Program Requirements (Compulsory): (91 credit hours)

Module ID	Module Title	Credit Hours	ECTS	Contact Hours		Prerequisite
				Lecture	Lab	
ME0214	Electronics for mechatronics	3	5	3	-	ENE211
ME0224	Computer Aided MATH for ME	2	4	-	6	MATH102, CS116
ME0312	Microcontrollers and IoT	4	6	3	3	CE211
ME0313	Microcontrollers and IoT lab	0	0	-	3	Coreq: ME0312
ME0344	Control Systems I	3	5	3	-	MECH0215, MATH205, ENE211
ME0345	Control and Vibration Lab	1	2	-	3	ME0344
ME0348	Sensors	3	5	3	-	ENE211, ENE213, MATH205
ME0354	Actuators	3	6	3	-	ME0348
ME0355	Sensors and Actuators Lab	1	0	-	3	ME0348, Coreq: ME0354
ME0391	Field Training	0	6	-	160 HR	Dept. Approval

# Bachelor of Science in Mechatronics and Artificial Intelligence Engineering

		12	30	-	20 WEEKS	ME0391, Dept. Approval
ME0491	International Internship					
ME0522	Hydraulics and Pneumatics	3	5	2	3	MECH0223
ME0523	Hydraulics and Pneumatics Lab	0	0	-	3	Coreq: ME0522
ME0548	Control Systems II	3	5	3	-	ME0344
ME0551	Robotics	3	5	3	-	ME0344
ME0561	Mechatronics Systems Design and Interfacing	3	5	2	3	ME0312, , ME0344, ME0354
ME0562	Mechatronics Systems Design and Interfacing Lab	0	0	-	3	Coreq: ME0561
ME0571	Machine Intelligence I	3	5	3	-	ME0344, ME0348
ME0572	Machine Intelligence II	3	5	3	-	ME0571
ME0577	Automation and Industry 4.0	3	5	2	3	ME0344
ME0578	Automation and Industry 4.0 Lab	0	0	-	3	Coreq: ME0577
ME0591	Graduation Project I	1	2	-	3	ME0491, MIN 132CH
ME0592	Graduation Project II	3	6	-	9	ME0591
MECH0215	Dynamics	3	5	3	-	MECH0216
MECH0216	Statics and Strength of Materials	3	5	3	-	PHYS103, MATH102
MECH0223	Thermofluids	3	5	3	-	MATH205
MECH0321	Thermofluids Lab	1	2	-	3	MECH0223
BM371	Numerical Methods for Engineers	3	5	2	3	CS116, MATH203, MATH205



# Bachelor of Science in Mechatronics and Artificial Intelligence Engineering

## 3.2. Program Requirements (Electives<sup>b</sup>): (12 credit hours)

A minimum of 12 credit hours of engineering coursework are required. This list is subject to modification based on School Council decisions prior to registration.

Module ID	Module Title	Credit Hours	ECTS	Contact Hours		Prerequisite
				Lecture	Lab	
ME0402	Advanced Electronics	3	5	3	-	ME0214
ME0403	Real-Time Computer Control Systems	3	5	3	-	ME0344
ME0404	Digital Control Systems	3	5	3	-	ME0344
ME0405	Process Control	3	5	3	-	ME0344
ME0406	CNC and Manufacturing Control	3	5	3	-	ME0344
ME0407	Linear Systems	3	5	3	-	ME0344
ME0408	Mobile Robots	3	5	3	-	ME0344
ME0409	Autonomous Systems	3	5	3	-	ME0344, ME0348
ME0410	Process Automation	3	5	3	-	ME0344
ME0411	Industrial Robotics	3	5	3	-	ME0344
ME0412	Mechatronics of Smart Materials	3	5	3	-	ME0344, ME0348
ME0413	Mechatronics Projects	3	5	3	-	ME0344, ME0312
ME0415	Smart Sensors	3	5	3	-	ME0348, CE211, ENE211
ME0417	Micro-Electromechanical Systems	3	5	3	-	ENE211, MECH0216
ME0418	Nano Systems	3	5	3	-	ENE211, MECH0216
ME0419	Autotronics	3	5	3	-	ME0214, ME0348
ME0420	Special Topics in Electrical and Electronics Engineering	3	5	3	-	Dept. Approval
ME0421	Special Topics in Control Engineering	3	5	3	-	Dept. Approval
ME0422	Special Topics in Robotics and Automation	3	5	3	-	Dept. Approval
ME0423	Special Topics in Computer and Digital Sciences	3	5	3	-	Dept. Approval
ME0424	Special Topics in Mechatronics Technology	3	5	3	-	Dept. Approval

# SATS Laboratories

Manufacturing Process
Industrial Automation
Ergonomics
Operation Research
Materials Science
DE simulation
Work Measurements
Hydraulics and Pneumatics
Automatic Control Lab
AutoCAD
Mechatronics Systems Design
Sensors and Actuators
Instrumentation and Measurements
PLC
Applied Thermal A & B
Thermo-fluid
Machine Design

# Mechatronics labs



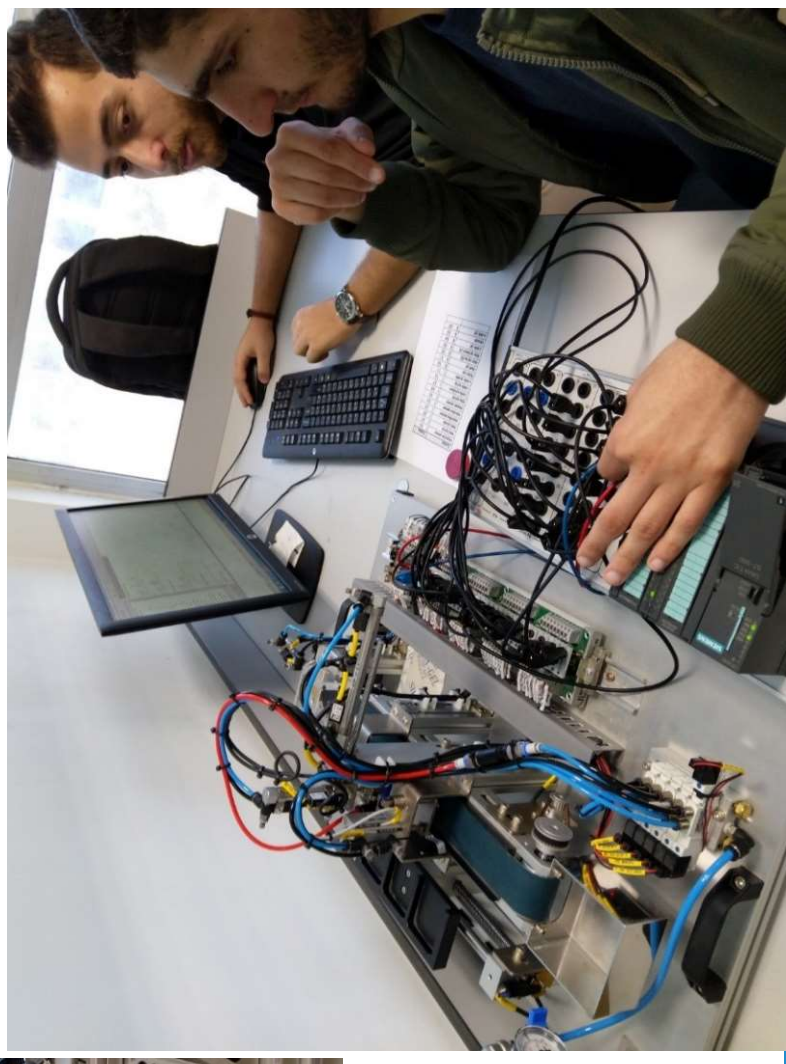
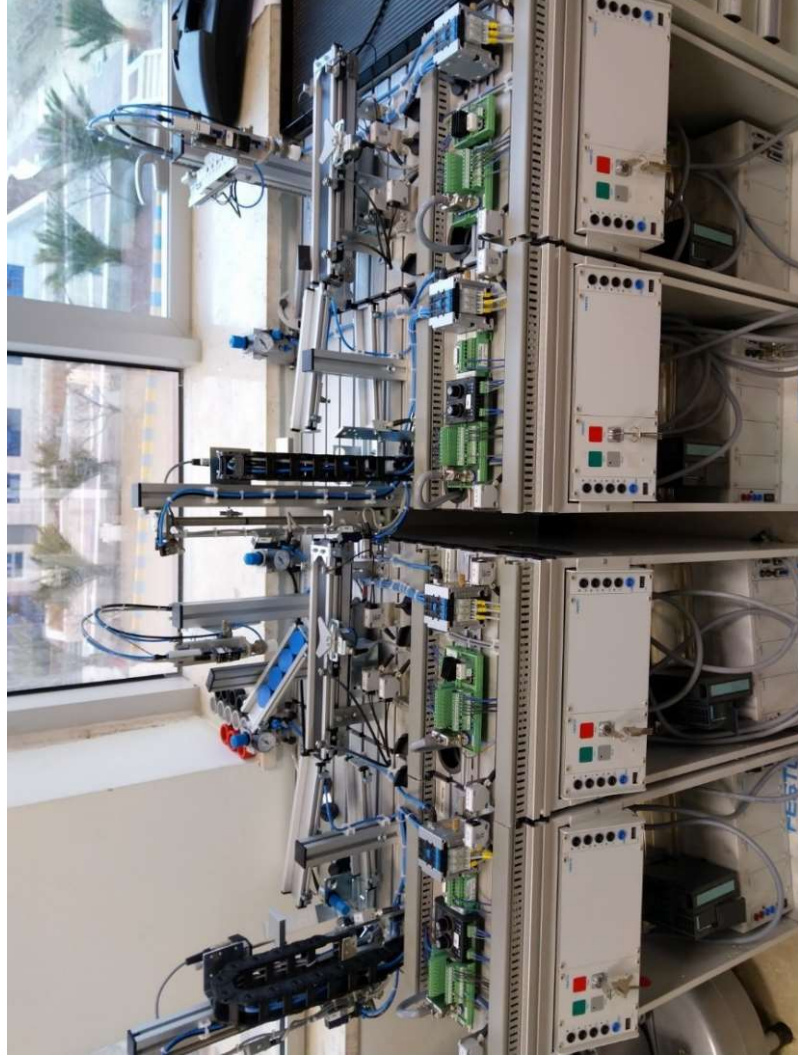


# Mechatronics labs

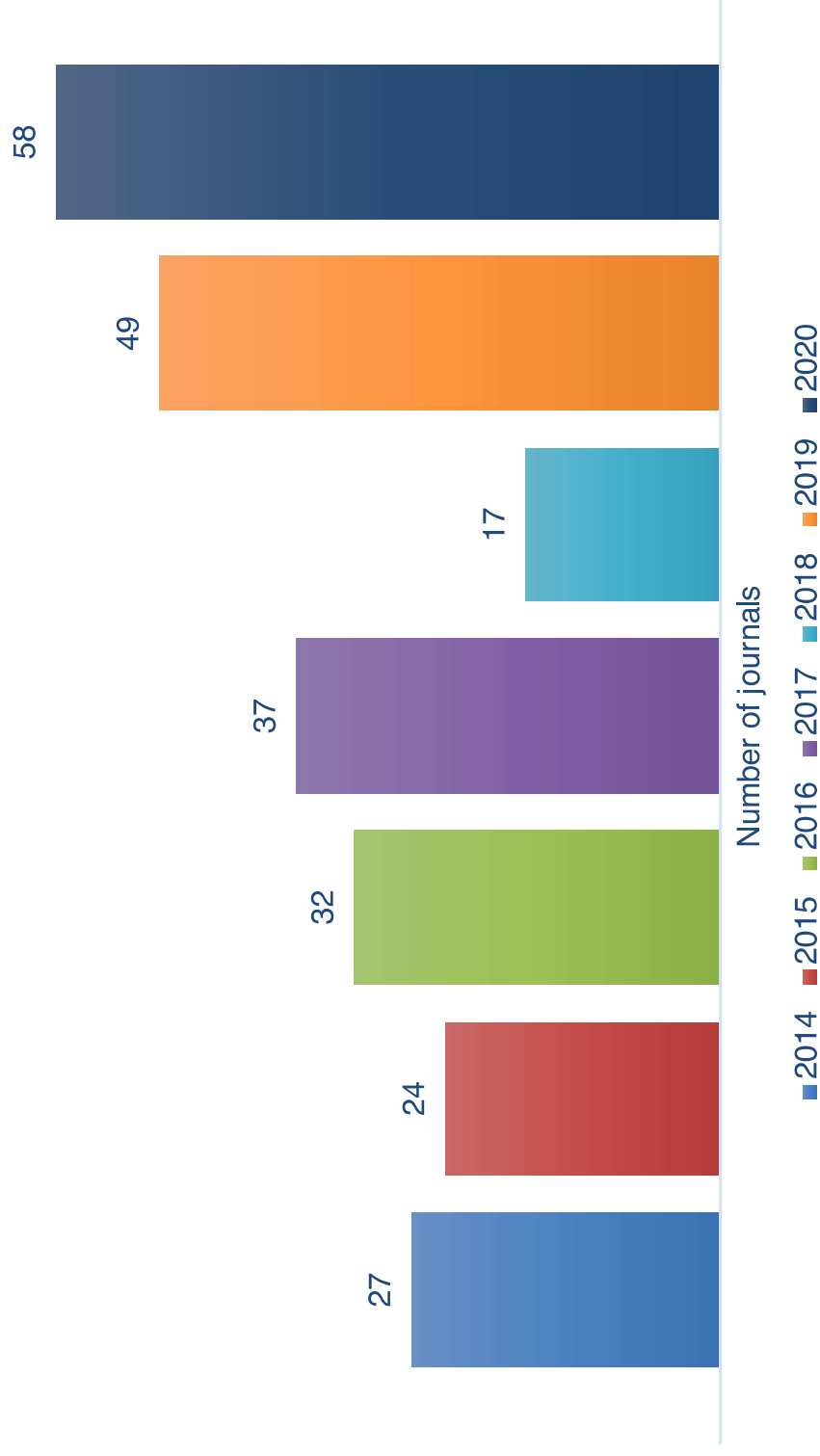




# Mechatronics labs



# Published Research in Journals and Conferences



# Students Exchange Structure

- 160 hours of practical training in Jordan before going to Germany
- 10 semesters bachelor program, with the 7<sup>th</sup> and 8<sup>th</sup> semesters spent in Germany
  - One semester at a German partner university (ideally, to study 4 elective courses) →

Process Control  
Robotics  
Microsystems  
Modeling and Simulation  
Sensors and Actuators  
Embedded Systems  
Special Topics in Mechatronics  
Automotive engineering  
Applied mechatronics systems  
AI & ML

- 20 weeks industrial training in Germany industry
- Accreditation
  - 1 Credit Hour = 1.5 ECTS = 1 SWS
  - Full semester load is 21 Credit Hours = 30 ECTS
  - Most courses are 3 Credit Hours = 5 ECTS
- Bachelor graduation project spanned over two semesters after the German-year

# Exchange Statistics

Bachelor thesis in Germany

**ME Outgoings Per Partner University**

**Network Head:** [Prof. Rolf Biesenbach](#)

<a href="#"><u>HS Aalen</u></a>
<a href="#"><u>HS Aschaffenburg</u></a>
<a href="#"><u>HS Bochum</u></a>
<a href="#"><u>HS Bochum</u></a>
<a href="#"><u>FH Brandenburg</u></a>
<a href="#"><u>FH Deggendorf</u></a>
<a href="#"><u>FH Frankfurt</u></a>
<a href="#"><u>HS Furtwangen</u></a>
<a href="#"><u>HS Heilbronn</u></a>
<a href="#"><u>FH Jena</u></a>
<a href="#"><u>HS Karlsruhe</u></a>
<a href="#"><u>DHBW Karlsruhe</u></a>
<a href="#"><u>Uni Kaiserslautern</u></a>
<a href="#"><u>HS Kempten</u></a>
<a href="#"><u>HS Krefeld</u></a>
<a href="#"><u>HS Merseburg</u></a>
<a href="#"><u>HS Mittweida</u></a>
<a href="#"><u>HS Niederrhein</u></a>
<a href="#"><u>Fachhochschule Oldenburg/Ostfriesland/Wilhelmshaven</u></a>
<a href="#"><u>FH Reutlingen</u></a>
<a href="#"><u>HS Schmalkalden</u></a>
<a href="#"><u>HTW Saarland</u></a>
<a href="#"><u>FH Wuerzburg-Schweinfurt</u></a>
<a href="#"><u>Jade HS Wilhelmshafen</u></a>
<a href="#"><u>HS Wismar</u></a>
<a href="#"><u>FH Zwickau</u></a>
<a href="#"><u>HS Zittau/Goerlitz</u></a>



# Exchange Statistics

Bachelor thesis in Germany

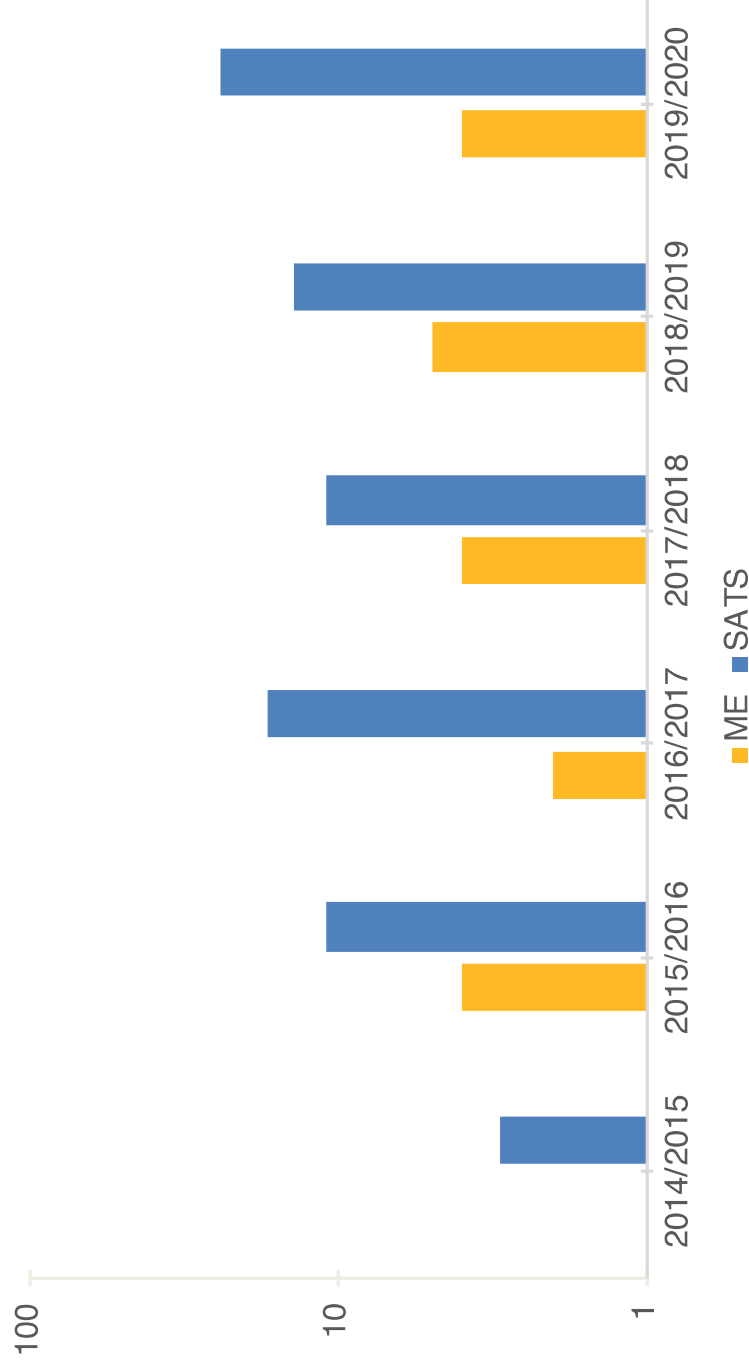
## ME Outgoings Per Partner University

Winter Semester 2021/2022	
Partner University	No. of ME Students
Aalen HS	2
Brandenburg FH	1
Frankfurt FH	1
Heilbronn HS	3
Kaiserslautern TU	1
Kempten HS	2
Merseburg HS	3
Niderrhein/Krefeld HS	2
Technische Hochschule Aschaffenburg	2
Würzburg-Schweinfurt FHWS (Campus Schweinfurt)	1
	18

# Exchange Statistics

## Bachelor thesis in Germany

NUMBER OF BACHELOR THESIS IN GERMANY



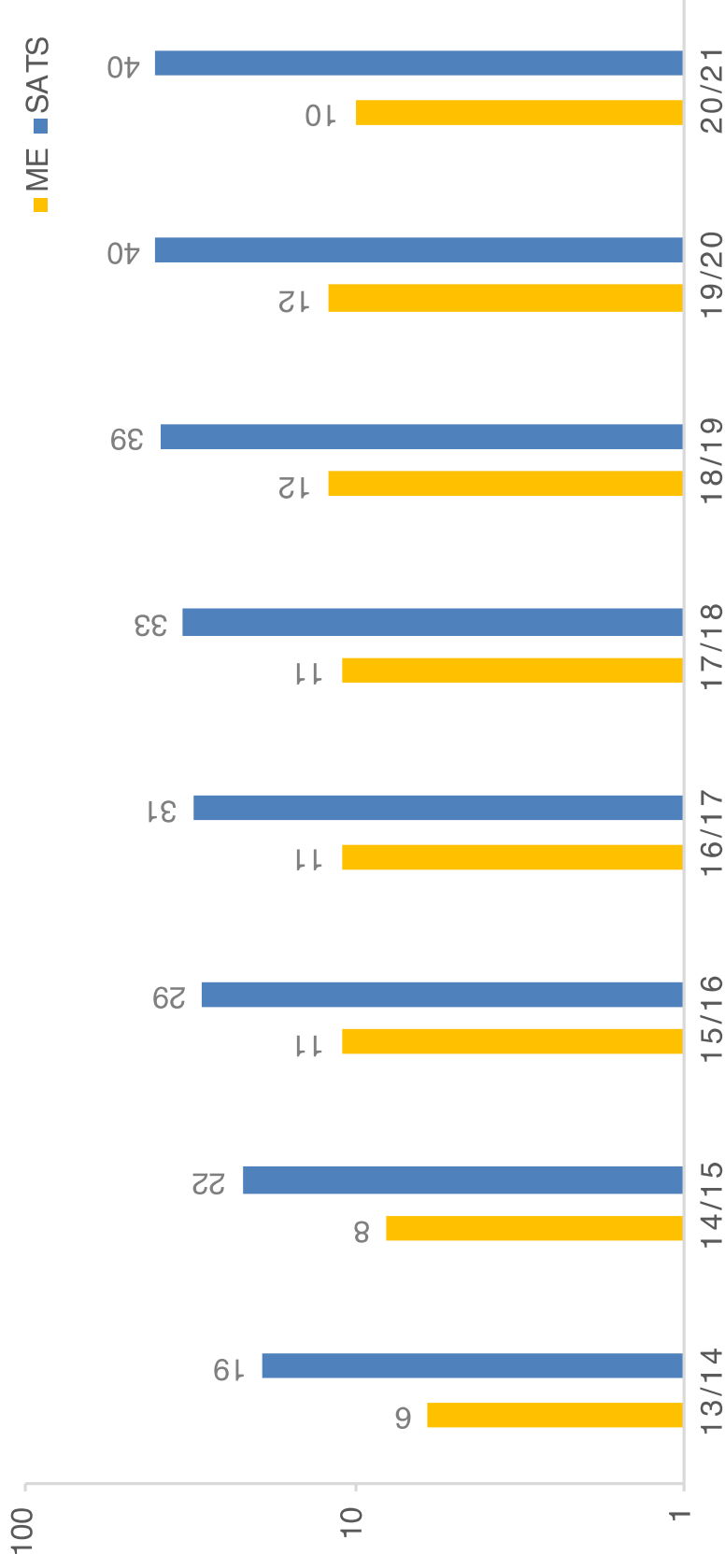
Companies where graduation projects are conducted at:

- Daimler AG
- Robert Bosch GmbH
- Bosch Rexroth AG
- Airbus SE
- Continental AG
- Fraunhofer Society
- Siemens AG
- SAP SE
- DHL

# Exchange Statistics

## Number of Staff members at ME&AI

### NUMBER OF FACULTY



# Exchange Statistics

## Visiting professors (FF)

- Prof. Dr. Klaus-Dieter Leimbach: Hochschule Heilbronn
- Mr. Ansgar Eckert: Hochschule für angewandte Wissenschaften Würzburg-Schweinfurt
- Prof. Dr. Dirk Stegelmeyer: Frankfurt University of Applied Sciences
- Prof. Dr. Gerhard Brauch-Widmann: Technische Hochschule Deggendorf
- Prof. Dr. Naser Al Natsheh: TU Braunschweig
- Prof. Dr. Peter Giesecke: Retired professor, HS Frankfurt
- Eng. Zuheir Mattar: Airbus Operations SAS
- Prof. Dr. Ralph Schuhmann: Ernst-Abbe-Fachhochschule Jena
- Prof. Dr. Wolfgang Eibner: Ernst-Abbe-Fachhochschule Jena
- Prof. Dr. Ansgar Meroth: Hochschule Heilbronn



# Cooperation Opportunities

- Flying Faculty
  - The DAAD & GJU support German professors to teach courses at GJU
  - GJU coordinates course matter and time period
- Train the Trainer
  - The DAAD supports GJU staff to spend periods of training in Germany
  - German side invites candidate
  - Duration between 1-3 months
- European Projects:
  - Quality assurance and accreditation
  - Mobility of staff and students
- Bidirectional Student Exchange:
  - bachelor level
  - Your students are welcome 😊

# Thank you for your attention