TECHNISCHE UNIVERSITÄT DRESDEN

DRESDEN concept

Prof. Thomas Mikolajick (Dean of Studies)
Manuela Tetzlaff (Study Advisor)
Benjamin Max (PhD Student)

Welcome and Information Meeting Master's Program Nanoelectronic Systems (NES)

Dresden, 08 October 2019

Welcome and general information

Get to know each other

Useful information for your studies

Welcome by dean of studies

Prof. Dr.-Ing. Thomas Mikolajick

Initiated by Cool Silicon cluster

Cool Silicon: Leading-Edge Cluster with the goal of energy efficiency in the information and communications technology (ICT) sector

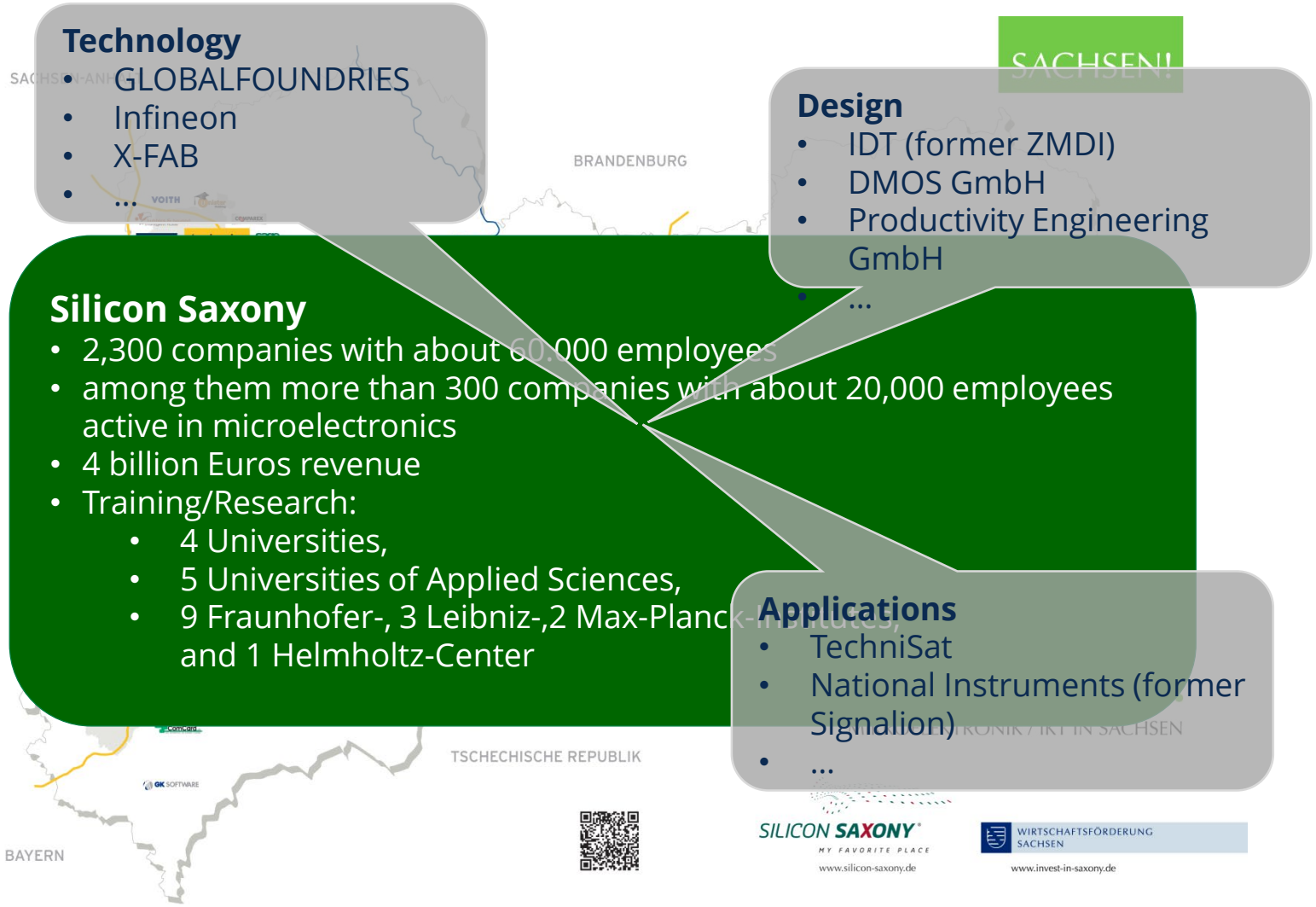
COOL SiLiCON

COOL Computing

COOL Reader

COOL Sensornet

Nanoelectronics in Saxony



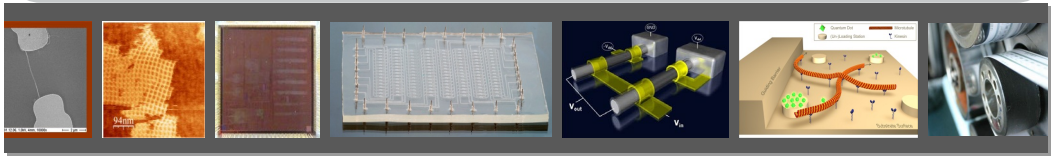
Nanoelectronics in research

cfaed CENTER FOR ADVANCING ELECTRONICS DRESDEN

„Advancing Electronics“

→ New perspectives for modern electronics

→ Overcoming the CMOS bottlenecks with complementary technologies



Electrical Engineering | **Computer Science**

Expertise:

Physics | **Chemistry** | **Biology** | **Mathematics**

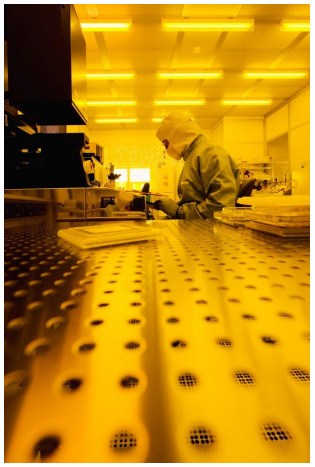
Engineering and natural sciences

Nanoelectronics at TU Dresden

- **Micro-, Opto- and Nanoelectronics** is one research focus of TU Dresden

- **Faculty of Electrical and Computer Engineering**
  - one of the oldest faculties for electrical engineering in Europe
  - one of the largest faculties for electrical engineering in Germany
  - Prof. Barkhausen was the founder of the first Low Power Technology Institute

- **Institute of Semiconductors and Microsystems** (IHM)
  - 411 m^2 Clean Room Laboratory (built 2006, extended 2013)
  - NaMLab gGmbH (2009)



- **Institute for Applied Physics** (Photo Physics, Semiconductor Physics)

- **Institute for Material Science**

Faculty of Electrical and Computer Engineering

Faculty Facts

- 28 full professors
- 4 junior professors
- 420 PhD Students
- 400 scientific employees
- 2.300 Students
- approx. 25 million Euro third party funding every year

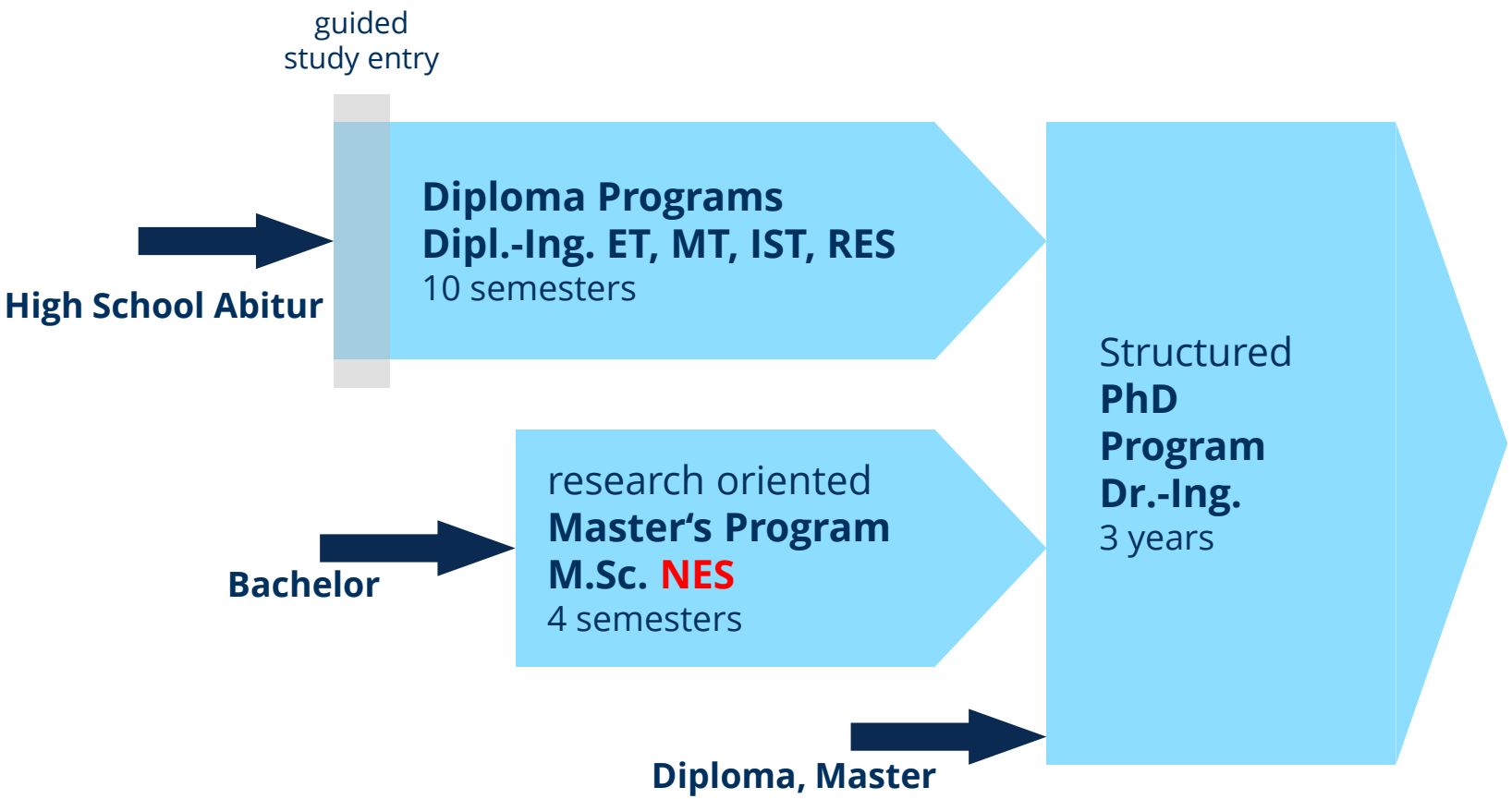
Research Fields

- Automation, Measurement & Control
- Communications Engineering
- Electrical Power Engineering
- Electromechanical and Biomedical Systems
- Information Electronics
- Micro-Opto-Nano Electronics

FAKULTÄT **ELEKTROTECHNIK**
UND **INFORMATIONSTECHNIK**

Faculty of Electrical and Computer Engineering

Scientific and research oriented education



Welcome and general information

Get to know each other

Useful information for your studies

Get to know each other

Sort by given name

- Short information about your person (name, age, family, hobbies…)

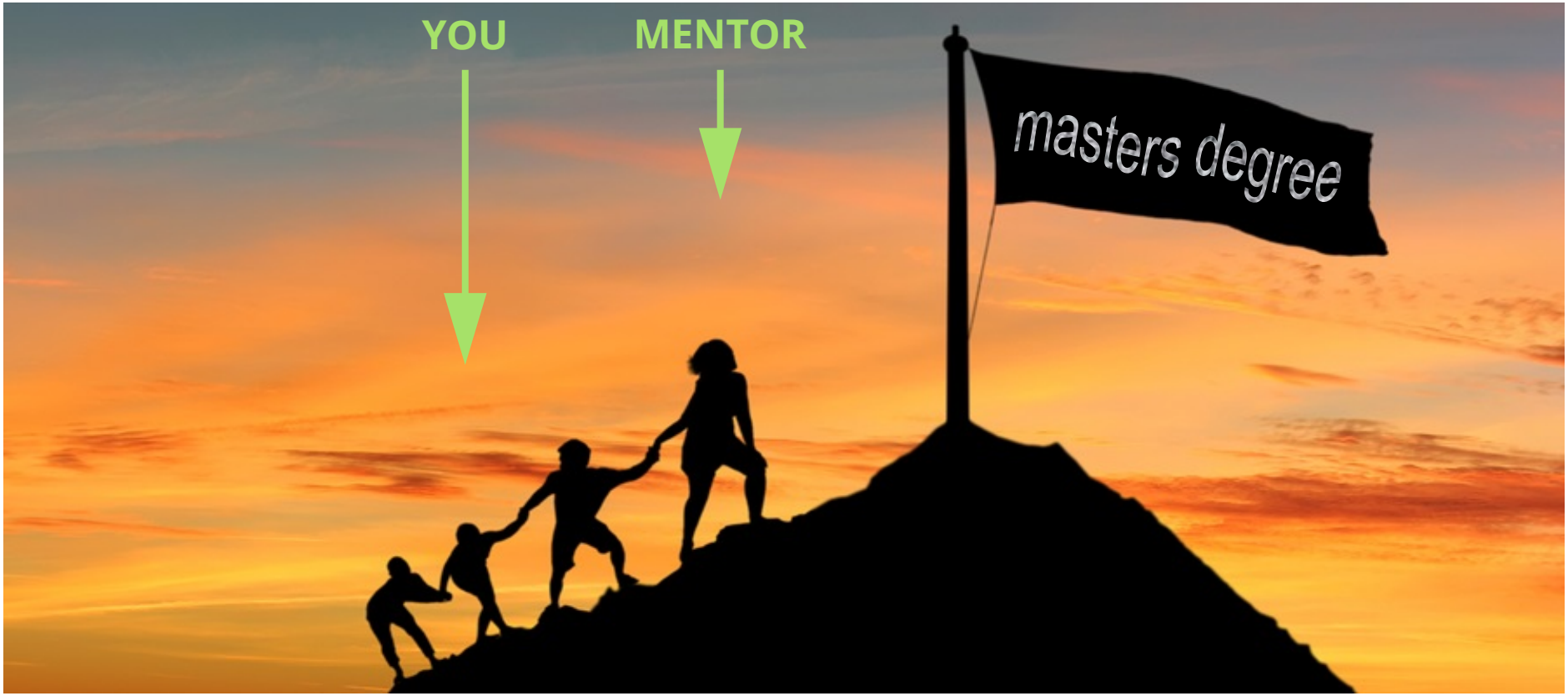
Sort by distance of your home town from the TU Dresden

- Where do you come from?
- Why did you come to Dresden?
- What did you do before (School, Studying, Work)?

What is your interest in the master‘s program?

- What is your motivation for studying Nanoelectronic Systems?
- What is your main interest?

NES student mentoring program

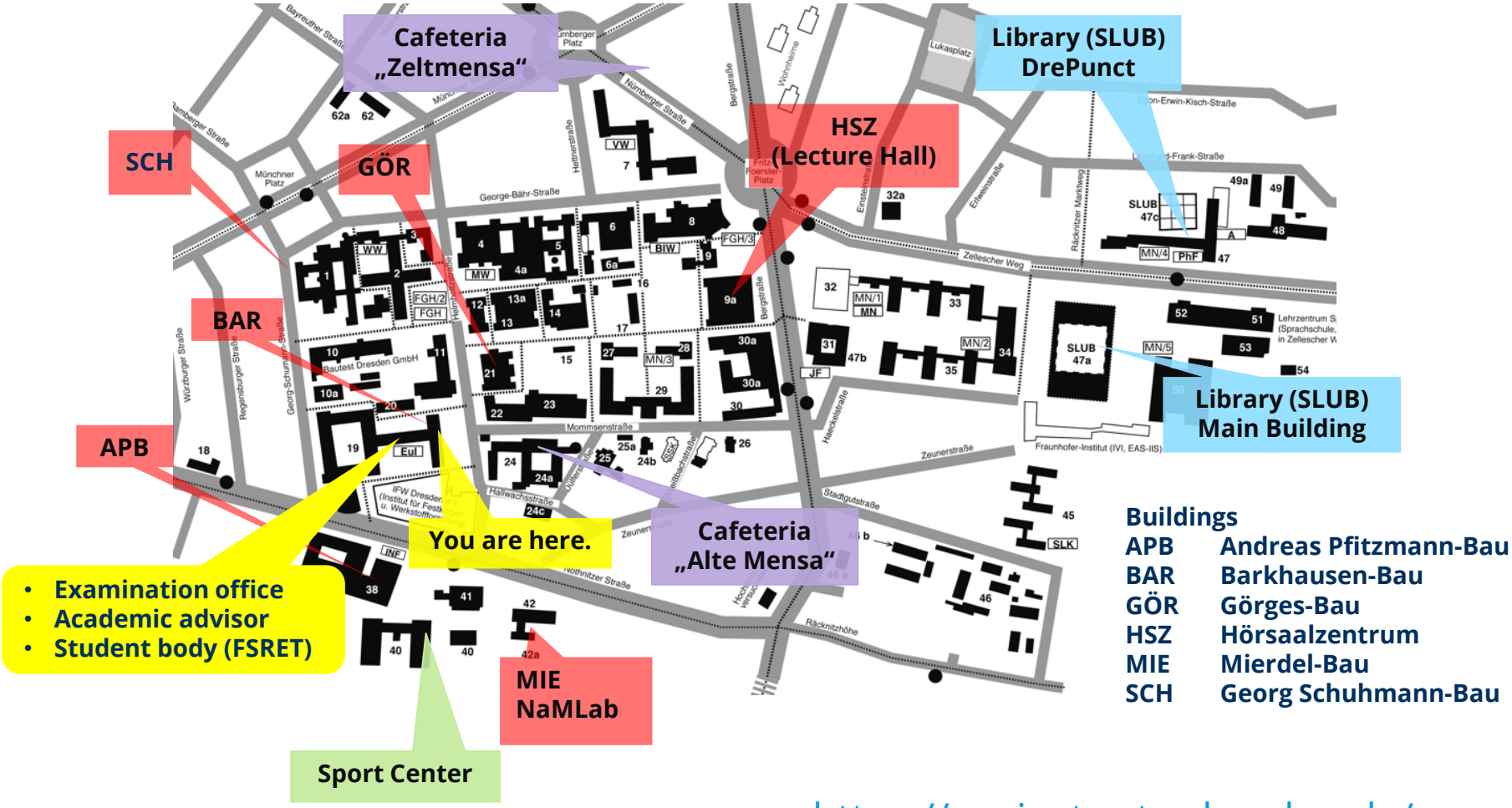


Welcome and general information

Get to know each other

Useful information for your studies

Orientation on TUD main campus



https://navigator.tu-dresden.de/

Important dates of the academic year

Winter Semester 2019/2020

01.10.2019 - 31.03.2020

- Courses and lectures: **14.10.2019 - 21.12.2019**
  06.01.2020 - 08.02.2020

- Lecture-free periods and bank holidays:

31.10.2019	Reformation Day
20.11.2019	Day of Prayer and Repentance
22.12.2019 - 05.01.2020	Turn of the year
10.02.2020 - 31.03.2020	Lecture-free period

- **Main exam period: 10.02.2020 – 07.03.2020**

Time system

Day

Double Session (Doppelstunde DS)

1. DS:	07:30	-	09:00
2. DS:	09:20	-	10:50
3. DS:	11:10	-	12:40
4. DS:	13:00	-	14:30
5. DS:	14:50	-	16:20
6. DS:	16:40	-	18:10
7. DS:	18:30	-	20:00
8. DS:	20:20	-	21:50

Schedule

Semester periods per week

(Semesterwochenstunden, SWS)

1 SWS = 45 minutes 1 DS = 2 SWS = 90 minutes

Example:

Memory Technology (4/0/2/0/0)

4 SWS Lecture (Vorlesung, V)
0 SWS Tutorial (Übung, Ü)
2 SWS Seminar (Seminar, Se)
0 SWS Language course (Sprachkurs, Sp)
0 SWS Lab Course (Praktikum, P)

Time system

Week

- Odd calendar week (1st week or 1. Kalenderwoche or 1. KW)
- Even calendar week (2nd week or 2. Kalenderwoche or 2. KW)

- Start of courses and lectures (winter semester 2019/2010): Monday, 14.10.2019
  → 42nd calendar week = even calendar week (2nd week)

Example

NES-12 12 01-14.1 Materials for Nanoelectronics and Vacuum Technology (4 0 1 0 0)

How to get your schedule

- Schedule provided by the faculty for all study courses (German version!)

  www.tu-dresden.de/et → Studies → Studying at the Faculty → Courses → Timetables → EuIMN-1-01

- **Schedule provided by NES study course (English version!)**

  www.tu-dresden.de/et → Studies → Studying at the Faculty → Study Programmes → Nanoelectronic Systems → Students

Timetable 1st semester (winter term 19/20)

Time/Day	Monday	Tuesday	Wednesday	Thursday	Friday
1 DS 7:30 - 9:00		E: German Language and Culture TUDIAS *NES-30 GLC-14.1 German Language and Culture*			
2 DS 9:20 - 10:50	P: Materials for Nanoelectronics Richter *NES-12 12 01-14.1 Materials for Nanoelectronics and Vacuum Technology*		L: Principles of Dependable Systems Fetzer *NES-11 06 02-14.1 Principles of Dependable Systems* *APB/E008/U*	L: Semiconductor Technology 1 Bartha *NES-12 12 02-14.1 Semiconductor Technology* *BAR/0106/H*	
3 DS 11:10 - 12:40	L: Systems Engineering 1 Fetzer *NES-11 06 06-14.1 Distributed Systems Engineering* *APB/E23/U*			L: Materials for Nanoelectronics Richter *NES-12 12 01-14.1 Materials for Nanoelectronics and Vacuum Technology* *GÖR/0127/U*	E: Systems Engineering 1 Fetzer *NES-11 06 06-14.1 Distributed Systems Engineering* *APB/E23/U*
4 DS 13:00 - 14:30		L: Semiconductor Technology 1 Bartha *NES-12 12 02-14.1 Semiconductor Technology* *BAR/0106/H*	E: Stochastic Signals and Systems Kortke *NES-12 09 01-14.1 Stochastic Signals and Systems* *GÖR/0229/U*	E: Principles of Dependable Systems Fetzer *NES-11 06 02-14.1 Principles of Dependable Systems* *APB/E008/U*	P: RoboLab Fetzer *NES-11 06 01-19.1 Lab Sessions* *APB/E046*
5 DS 14:50 - 16:20	P: Materials for Nanoelectronics Richter *NES-12 12 01-14.1 Materials for Nanoelectronics and Vacuum Technology*	L: Stochastic Signals and Systems Kortke *NES-12 09 01-14.1 Stochastic Signals and Systems* *GÖR/0127/U* E: Hardware Modelling and Simulation Göhringer *NES-11 20 20 Hardware Modelling and Simulation* *APB/E006/U*		E: German Language and Culture TUDIAS *NES-30 GLC-14.1 German Language and Culture*	
6 DS 16:40 - 18:10		L: Vacuum Technology Bartha *NES-12 12 01-14.1 Materials for Nanoelectronics and Vacuum Technology* *BAR/106/H*	L: Fundamentals of Estimation and Detection Rave *NES-12 10 01-14.1 Fundamentals of Estimation and Detection* *BAR/0106/H*	E: Fundamentals of Estimation and Detection Rave NES-12 10 01-14.1 Fundamentals of Estimation and Detection BAR/0106/H V: Hardware Modelling and Simulation Göhringer *NES-11 20 20 Hardware Modelling and Simulation* *APB/E008/U*	

The timetable is subject to changes!

Date: 1st October, 2019

L = Lecture
E = Exercise
P = Practical Lab Course

Mandatory Modules	
NES-11 06 01	Lab Sessions
NES-11 06 02	Principles of Dependable Systems
NES-12 10 01	Fundamentals of Estimation and Detection
NES-12 12 02	Semiconductor Technology

Elective Modules	
NES-30 GLC-14.1	German Language and Culture
NES-11 06 06-14.1	Distributed Systems Engineering
NES-12 09 01-14.1	Stochastic Signals and Systems
NES-12 12 01-14.1	Materials for Nanoelectronics and Vacuum Technology
NES-11 20 20	Hardware Modelling and Simulation

1st week: odd calendar week
2nd week: even calendar week

Curriculum – compulsory modules

		1st Sem.	2nd Sem.	3rd Sem.	4th Sem.
Compulsory Modules					
NES-11 06 01 - 19.1	Lab Sessions	5 CP			
NES-11 06 02 - 14.1	Principles of Dependable Systems	6 CP			
NES-12 10 01 - 14.1	Fundamentals of Estimation and Detection	6 CP			
NES-12 12 02 - 14.1	Semiconductor Technology	9 CP			
NES-12 08 02 - 14.1	Radio Frequency Integrated Circuits		7 CP		
NES-12 10 03 - 14.1	Hardware/Software Co-design		4 CP		
NES-12 ASW - 14.1	Academic and Scientific Work			4 CP	
NES-12 PW - 14.1	Project Work			10 CP	
	Master Thesis and Defense				30 CP
Elective modules		6 CP	17 CP	16 CP	
Total credits		30 CP	30 CP	30 CP	30 CP

Curriculum – compulsory modules

EMM-nano students

Nanoscience and Nanotechnology

		1st Sem.	2nd Sem.	3rd Sem.	4th Sem.
Compulsory Modules					
NES-12 ASW - 14.1	Academic and Scientific Work			4 CP	
NES-12 PW - 14.1	Project Work			10 CP	
	Master Thesis and Defense				30 CP
Elective Modules				16 CP	
Total credits		30 CP	30 CP	30 CP	30 CP

Leuven

Curriculum – compulsory modules

Lab Sessions – RoboLab Autumn Course

Task	Create and program your own robot using LEGO Mindstorm *Understand Hamming Codes and create a Stack Machine*
Schedule	Friday every week, **4. DS** 13:00 - 14:30 || 1 pm - 2:30 pm Room: **APB/E046** (and E044 if needed)
Introduction	We start on **Friday, October 18th, 2019**
Enrollment	HISQIS, Module **„NES-11 06 01 Lab Sessions“** (140701) until **November 2nd, 2019**
Details	https://se.inf.tu-dresden.de/robolab2

Curriculum – elective modules

NES students

- 30 elective modules with 185 credit points
- You have to select modules with at least **39 credit points**
- You can choose modules of the catalogue by your own choice.
  The classification of modules (Application, Technology, Design) is a guideline for you only

EMM students

- No further action required

Current study guide with module descriptions

https://tu-dresden.de/ing/elektrotechnik/ressourcen/dateien/studium/master-nes/Modulkatalog-NES-eng

German language and culture

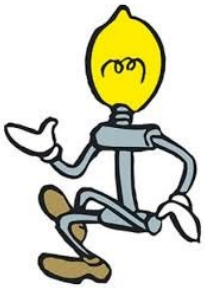
German Language and Culture (Module NES-30 GLC-14.1)

Study documents

- Current study guide with module descriptions
- Examination regulations
- Study regulations
- Examination schemes

https://tu-dresden.de/ing/elektrotechnik/studium/beratung-und-service/studiendokumente-und-ordnungen/master-nes

Solving problems



- Visit the website of the program
  https://tu-dresden.de/ing/elektrotechnik/studium/studieren-an-der-fakultaet/master-nes
- Ask fellow students or your mentor
- Contact the academic advisor (study course, general problems,...)

  Manuela Tetzlaff, BAR 161
  Office hours: Tuesday: 13:00 – 14:00
  Thursday: 13:00 – 14:00
  Email: master-nes@mailbox.tu-dresden.de

- Contact the examination office (questions about exams, (de-)registration, grades, ...)

  Uta Strempel, BAR 177a
  Office hours: Tuesday: 13:00 – 17:30
  Thursday: 13:00 – 15:30

- Contact the international office (questions about enrollment, visa, leave of absence, ...)

  Email: studium.international@mailbox.tu-dresden.de

Examination regulations and procedures

Additional meeting in November

→ Manuela will send around an invitation

Studying in Germany

- 15 weeks lectures, tutorials and lab courses, 4 weeks exams afterwards
- Learning during the exam weeks only is not enough!
  → attend all classes every week, participate actively and start working on problems during the semester
  → treat your study like a 40hour, full-time-job

Workload for each module is given in the module description

- Rule of thumb: 1 credit point is earned through 30 hours of work!
- Example: 180 hours (6 CP) for „Fundamentals of Estimation and Detection“

Lectures (2 hours x 15 weeks)	30
Tutorials (2 hours x 15 weeks)	30
Preparation for exam (38 hours)	38
Exam (2 hours)	2

- Rework transcript after lecture
- Read transcript before next lecture
- Solve exercises
- Discuss issues with fellow students
- Studying related books
- etc.

German culture

- What do you consider as typical characteristics of Germans, which have you heard about?
- Which German characteristics have you encountered?
- Choose one German characteristic and explain the difference to the culture of your home country?

German culture

- Come to appointments and lectures in time (and observe deadlines!)
- Salutation with title and surname
  (especially for people that are hierarchically higher than you)
- More subject- and work-oriented than people-oriented
- Direct criticism → no loss of face
- If you have any questions: don't be afraid to ask!

Study commission

Prof. Thomas Mikolajick (Dean of Studies)

Prof. Gerhard Fettweis

Prof. Kambiz Jamshidi

Student representatives

- **Shaif Grover**
- **Eashika Gosh**
- **Shruthi Mudiyunur Narahari**

Consulting members (without a vote)

- **Prof. Christof Fetzer**
- **Ellen Töpfer (Examination Office)**
- **Manuela Tetzlaff (Study Advisor)**

Miscellaneous

TUD Email

- xxx@tu-dresden.de
- **IMPORTANT: check this Email on a regular basis (at least once a week)**
  → forward this to your regular mail account
- Important for OPAL (ask your mentor or corresponding professor for further details)

Faculty PC Pool

- BAR I/61

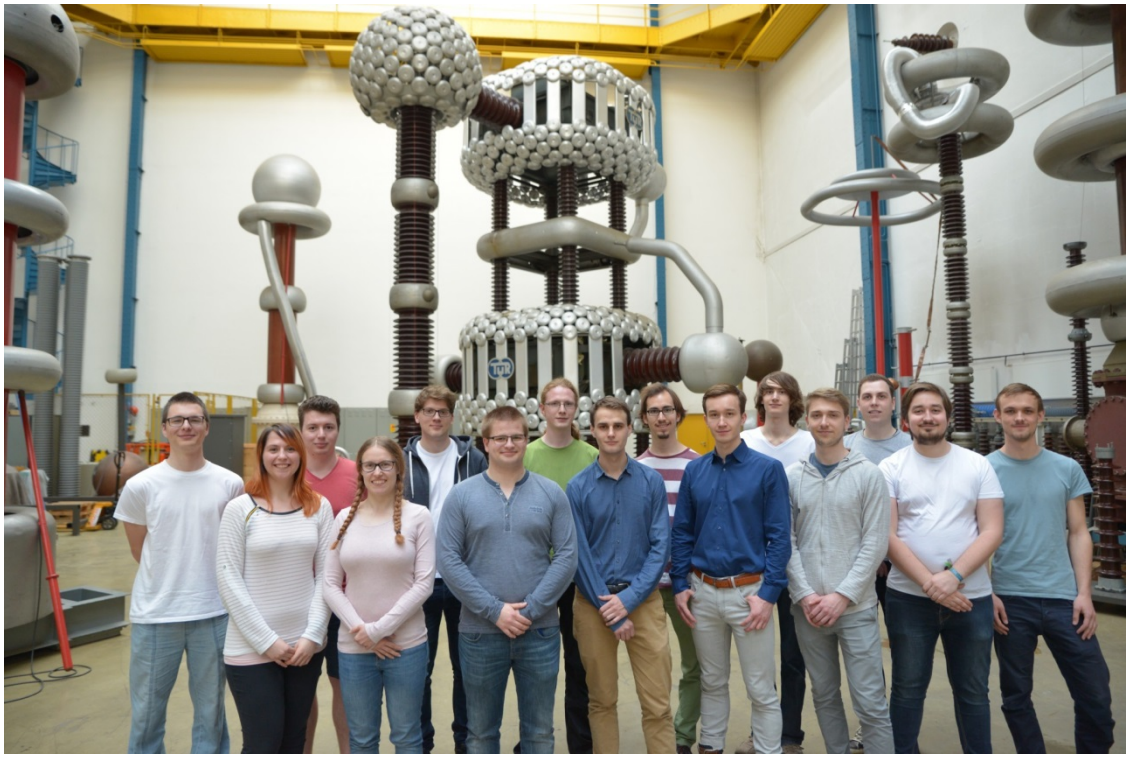
Wireless LAN

- www.tu-dresden.de/zih → A-Z → WiFi networks (WLAN)

Library

- Zellescher Weg 18, 01069 Dresden
  www.slub-dresden.de

Student body of the faculty



www.fsret.de

Welcome to Dresden!

Offers of the Student Council (Fachschaftsrat)

- October 8th:
  - 14:10 LaborTour (registration needed; meeting point: in front of BAR)
  - 20:00 ClubTour(meeting point: Wu5)

- October 11th:
  - 18:00 ESEFETE (first semester party, BAR)

Have a good start!