

Computational Modeling and Simulation

Welcome Introduction

Prof. Martin Weigert – Program Coordinator

Dresden, 2025-10-09

Agenda

1. Welcome and opening remarks (Prof. Dr. Weigert)
2. TU Dresden and the faculties involved (Prof. Dr. Weigert)
3. Program Overview (Prof. Dr. Weigert)
4. Tracks of the study program (6 CMS Track Coordinators)
5. Personal mentoring system (Prof. Dr. Weigert)
6. Curricular module system (Prof. Dr. Weigert)
7. Fast-track to PhD option, PhD programs (Prof. Dr. Weigert)
8. Language Centre / TUDIAS (Prof. Dr. Weigert)
9. Examination Office (Ms Schütze)
10. ServiceCenterStudies (Ms Brand)
11. Complaints Office (Prof. Dr. Weigert)
12. Core Values and Guiding Principles (Prof. Dr. Weigert)
13. Student Representatives -iFSR (Mr Eliah Lohr)

Computational Modeling and Simulation

Welcome and Opening Remarks



Welcome



City of Dresden

- >500.000 inhabitants
- >200 bars and clubs in Neustadt alone
- Baroque old town
- Semper Opera
- Symphony hall
- 10 theaters
- 50 museums
- Botanical gardens
- Vibrant art scene
- Dozens of festivals throughout the year
- 1.5 hrs from Prague or Berlin



Surroundings of Dresden

- National park „Sächsische Schweiz“
- Local recreational area „Dresdner Heide“
- Nature reserve „Königsbrücker Heide“
- Many more parks, castles, etc.



Science in Dresden

- 3 Max Planck Institutes
- 11 Fraunhofer Institutes
- 4 Leibniz Institutes
- 2 Helmholtz Centers
- TU Dresden (32'000 students, 126 programs, super-computer, library with >9M volumes)
- HTW Dresden
- School of Arts
- High-tech companies, including Global Foundries, Bosch, Siemens, Infineon, SAP and Zeiss



Computational Modeling and Simulation: Class of 2025

- 771 applications (source: CMS Admin)
- 304 students admitted (source: CMS Admin)
- 143 students enrolled (on 7 October)



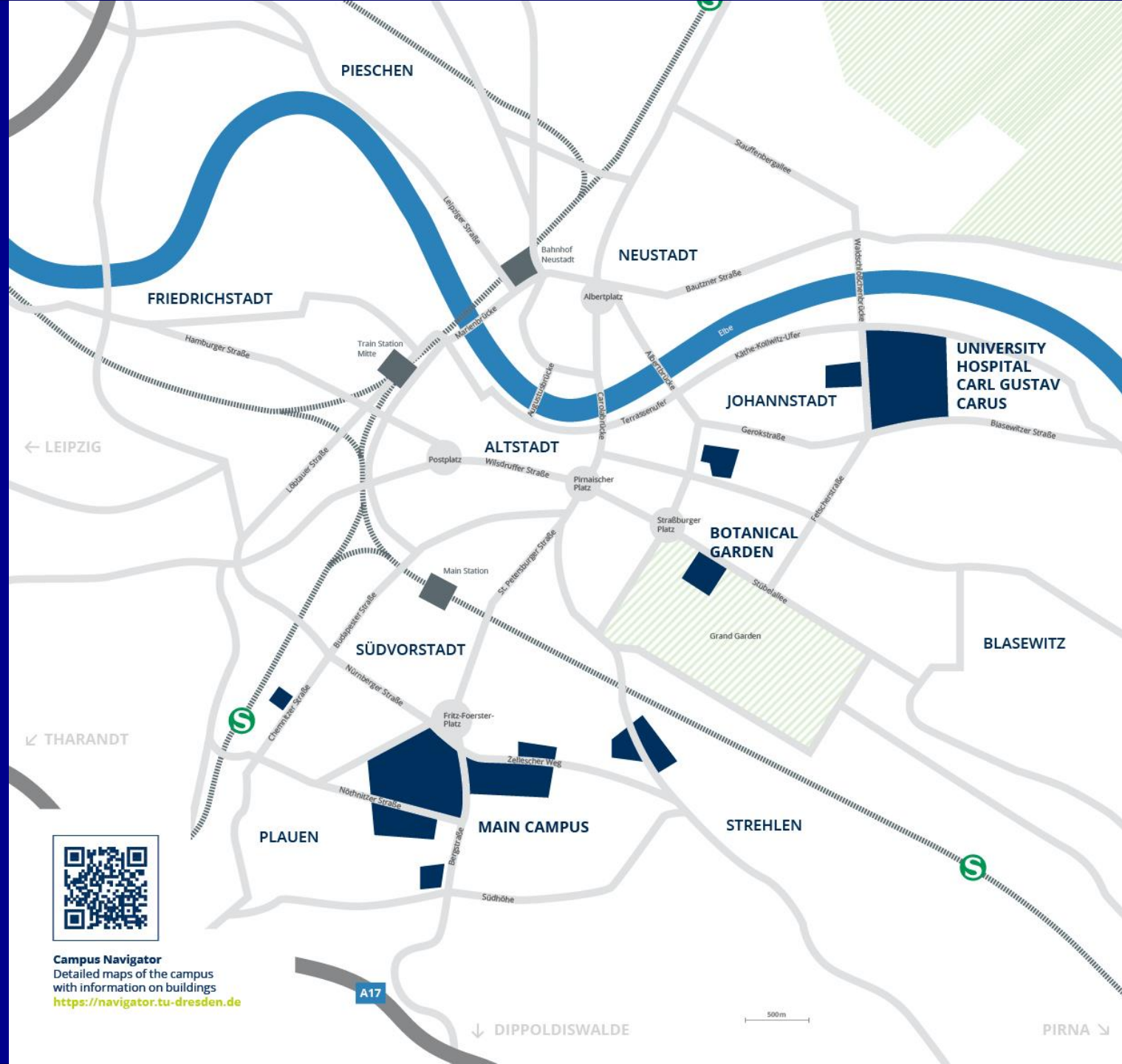
Computational Modeling and Simulation

TU Dresden and the Faculties involved

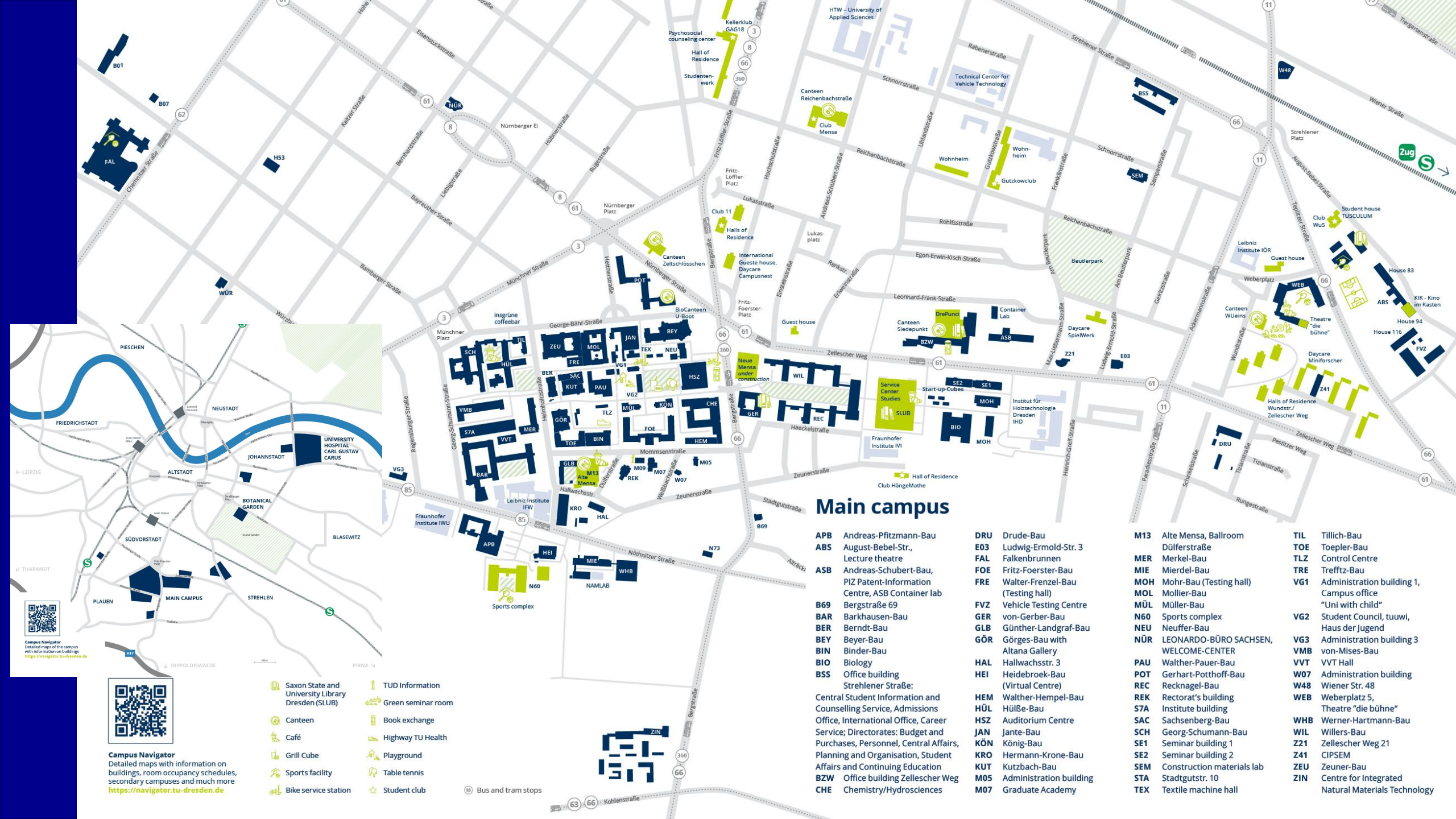


TU Dresden, estd. 1828

Campus



Campus Navigator
Detailed maps of the campus
with information on buildings
<https://navigator.tu-dresden.de>



Main campus

- APB** Andreas-Pfitzmann-Bau
ABS August-Bebel-Str.,
Lecture theatre
ASB Andreas-Schubert-Bau,
PIZ Patent-Information
Centre, ASB Container lab
B69 Bergstraße 69
BAR Barkhausen-Bau
BER Berndt-Bau
BEY Beyer-Bau
BIN Binder-Bau
BIO Biology
BSS Office building
Strehlener Straße:

Central Student Information and
Counselling Service, Admissions
Office, International Office, Career
Service; Directorates: Budget and
Purchases, Personnel, Central Affairs,
Planning and Organisation, Student
Affairs and Continuing Education
BZW Office building Zellescher Weg
CHE Chemistry/Hydrosiences

- DRU** Drude-Bau
E03 Ludwig-Ermold-Str. 3
FAL Falkenbrunnen
FOE Fritz-Foerster-Bau
FRE Walter-Frenzel-Bau
(Testing hall)
FVZ Vehicle Testing Centre
GER von-Gerber-Bau
GLB Günther-Landgraf-Bau
GÖR Görge-Bau with
Altana Gallery
HAL Hallwachsstr. 3
HEI Heidebrook-Bau
(Virtual Centre)
HEM Walther-Hempel-Bau
Hülse-Bau
HSZ Auditorium Centre
JAN Jante-Bau
KÖN König-Bau
KRO Hermann-Krone-Bau
KUT Kutzbach-Bau
M05 Administration building
M07 Graduate Academy

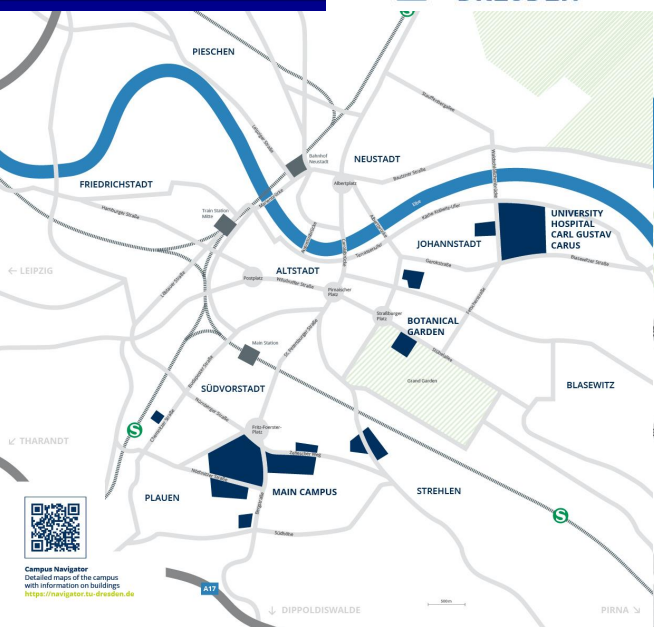
- M13** Alte Mensa, Ballroom
Dülferstraße
MER Merkel-Bau
MIE Mierdel-Bau
MOH Mohr-Bau (Testing hall)
MOL Mollier-Bau
MÜL Müller-Bau
N60 Sports complex
NEU Neuffer-Bau
NÖR LEONARDO-BÜRO SACHSEN,
WELCOME-CENTER
PAU Walther-Pauer-Bau
POT Gerhart-Potthoff-Bau
REC Recknagel-Bau
REK Rectorat's building
S7A Institute building
SAC Sachsenberg-Bau
SCH Georg-Schumann-Bau
SE1 Seminar building 1
SE2 Seminar building 2
SEM Construction materials lab
STA Stadtgutstr. 10
TEX Textile machine hall

- TIL** Tillich-Bau
TOE Toepler-Bau
TLZ Control Centre
TRE Trefftz-Bau
VG1 Administration building 1,
Campus office
VG2 Student Council, tuuwi,
Haus der Jugend
VG3 Administration building 3
von-Mises-Bau
VVB VVT Hall
W07 Administration building
Wiener Str. 48
WEB Weberplatz 5,
Theatre "die bühne"
WHB Werner-Hartmann-Bau
WIL Willers-Bau
Z21 Zellescher Weg 21
Z41 CIPSEM
ZEU Zeuner-Bau
ZIN Centre for Integrated
Natural Materials Technology

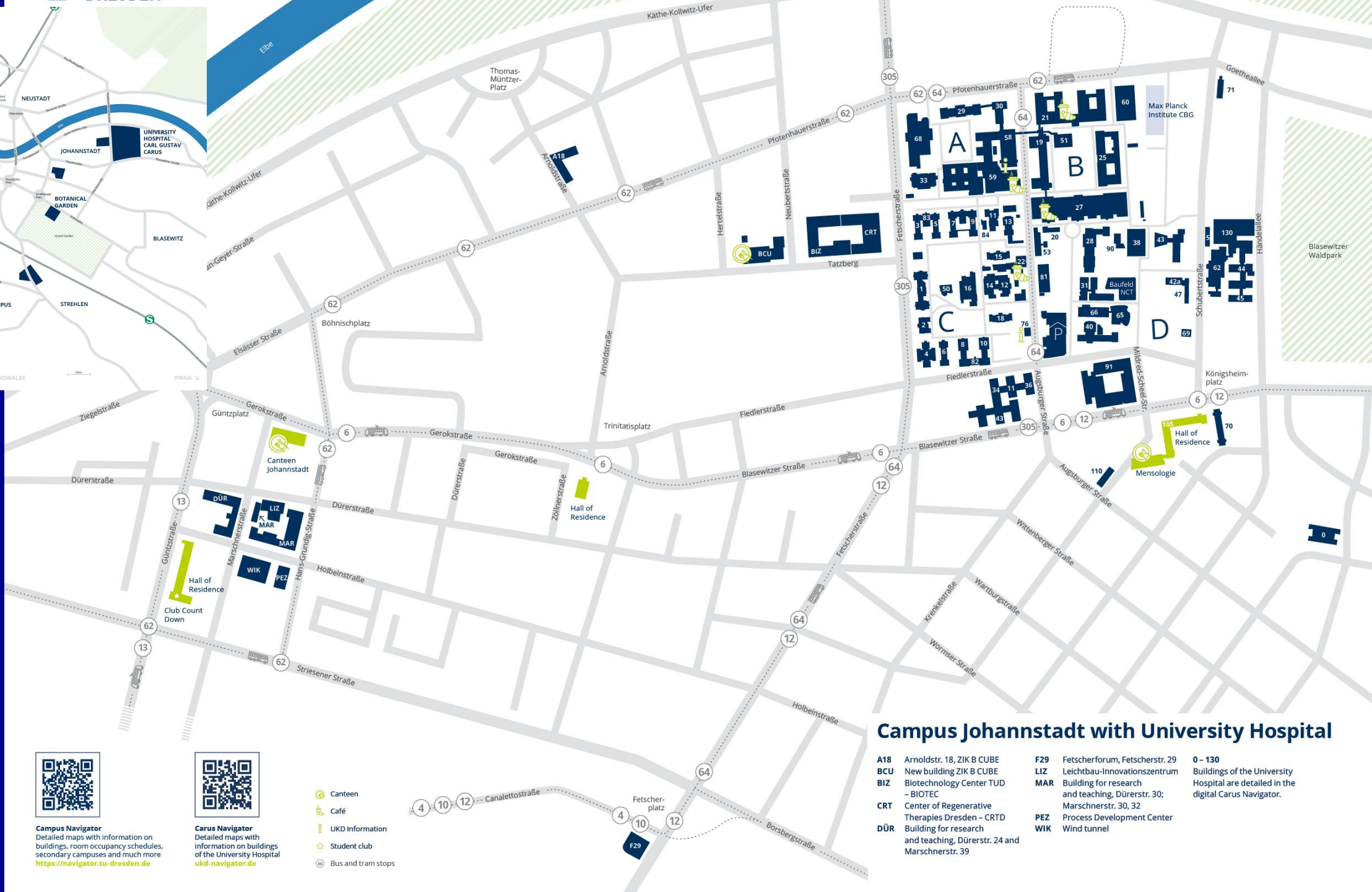
-  Saxon State and
University Library
Dresden (SLUB)
 TUD Information
 Green seminar room
 Book exchange
 Highway TU Health
 Playground
 Table tennis
 Student club

-  Canteen
 Café
 Grill Cube
 Sports facility
 Bike service station

Campus Navigator
Detailed maps of the campus
with information on buildings,
secondary campuses and much more
<https://navigator.tu-dresden.de>



Campus Navigator
Detailed maps of the campus
with information on buildings
<https://navigator.tu-dresden.de>



Campus Navigator
Detailed maps with information on
buildings, room occupancy schedules,
secondary campuses and much more
<https://navigator.tu-dresden.de>



Carus Navigator
Detailed maps with
information on buildings
of the University Hospital
ukd-navigator.de

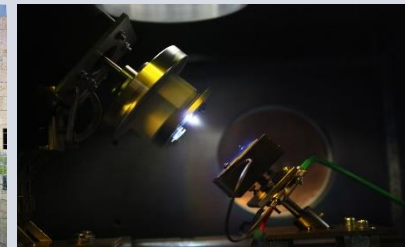
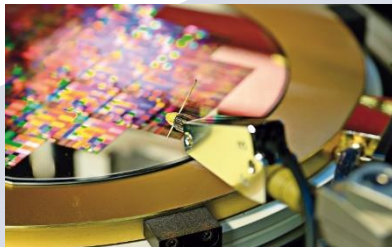
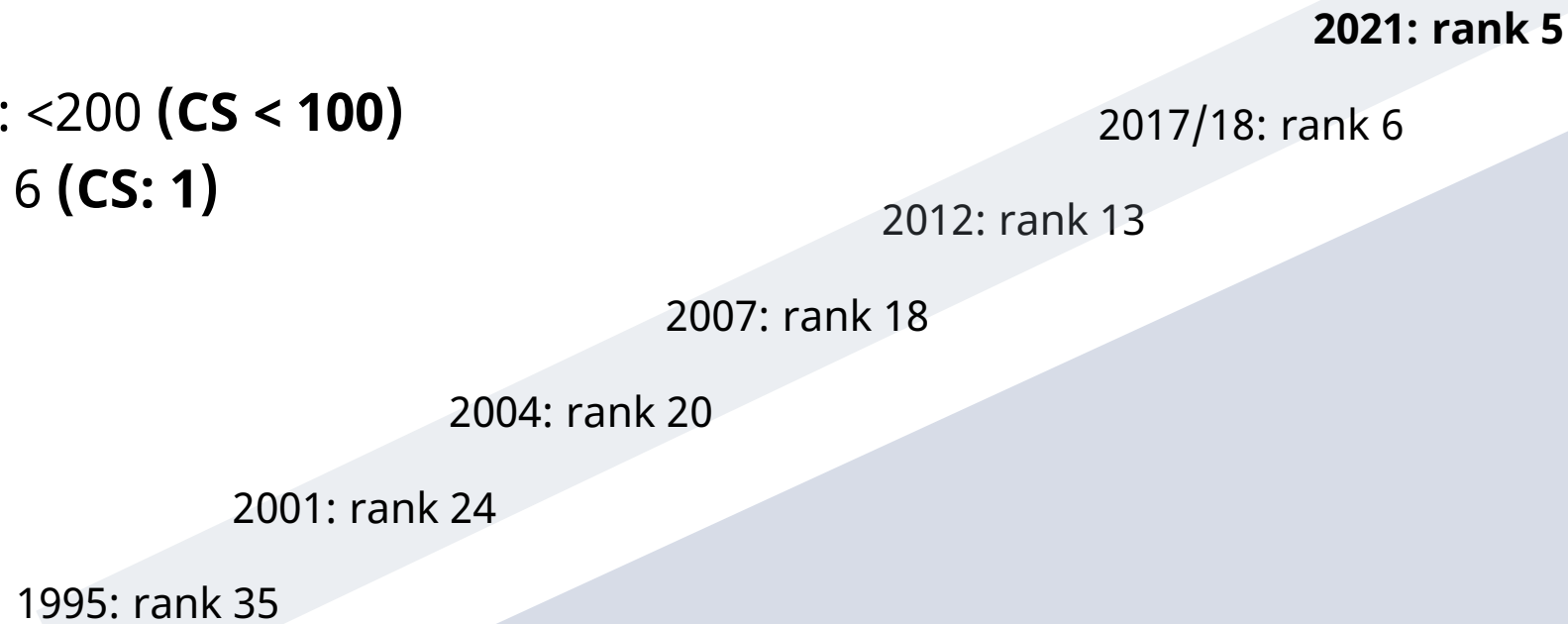
- Canteen
- Café
- UKD Information
- Student club
- Bus and tram stops

Campus Johannstadt with University Hospital

- | | | |
|--|---|--|
| A18 Arnoldstr. 18, ZIK B CUBE | F29 Fetscherforum, Fetscherstr. 29 | 0 – 130 Buildings of the University Hospital are detailed in the digital Carus Navigator. |
| BCU New building ZIK B CUBE | LIZ Leichtbau-Innovationszentrum | |
| BIZ Biotechnology Center TUD – BIOTEC | MAR Building for research and teaching, Dürerstr. 30; Marschnerstr. 30, 32 | |
| CRT Center of Regenerative Therapies Dresden – CRTD | PEZ Process Development Center | |
| DÜR Building for research and teaching, Dürerstr. 24 and Marschnerstr. 39 | WIK Wind tunnel | |

TU Dresden in the Rankings

- QS, THE rank: <200 (**CS < 100**)
- DFG ranking: 6 (**CS: 1**)



Excellence University since 2012



5 Ongoing/new clusters of excellence in 2025

CeTI: Centre for Tactile Internet with Human-in-the-Loop

Speaker: Prof. Frank Fitzek

CeTI explores how humans and machines can share knowledge and skills in real time to promote greater participation, resilience, and technological sovereignty. The Cluster of Excellence combines interdisciplinary research with practical applications, bringing future technologies to society, education, and industry.



[> further information on CeTI](#)

ct.qmat: Complexity and topology in quantum materials

Speaker at the Dresden site: Prof. Matthias Vojta

The global competition for quantum technologies is in full swing. Materials that exhibit exotic phenomena play a decisive role in this. Right at the forefront: the Cluster of Excellence ct.qmat - Complexity and Topology in Quantum Materials.



[> further information on ct.qmat](#)

PoL: Physics of Life

Speaker: Prof. Otger Campàs

Understanding life down to its smallest components is one of the great challenges of our time. Why does the heart beat on the left side and how do the laws of physics influence our DNA?



[> further information on PoL](#)

CARE: Climate-Neutral and Resource-Efficient Construction

Speaker: Prof. Dr. Viktor Mechtcherine (TUD) and Prof. Dr. Martin Claßen (RWTH Aachen University)

The Cluster of Excellence CARE of TU Dresden and RWTH Aachen University aims to use climate-friendly building materials, construction principles and production technologies to show ways towards sustainable construction in every respect.



[> further information on CARE](#)

REC²: Responsible Electronics in the Climate Change Era

Speaker: Prof. Dr. Yana Vaynzof

The REC² cluster creates the scientific basis for the electronics of the future: new material platforms, component concepts and integrated systems with which responsible electronics can be realized in an ecologically, economically and socially sustainable way.



[> more information about REC²](#)

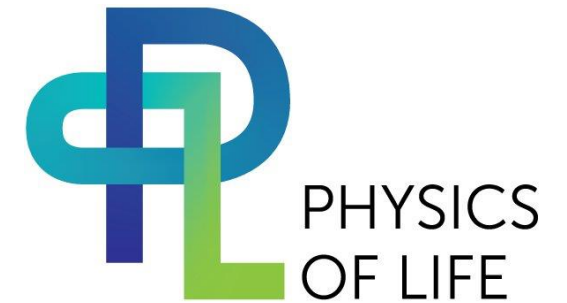
Dresden Concept: 12,500 scientists



Local Research Centers in CMS



Deutsches Zentrum
für Luft- und Raumfahrt
German Aerospace Center





Faculty of Computer Science

Institutes and Chairs

- Institute of Applied Computer Science
- **Institute of Artificial Intelligence**
- **Institute of Software and Multimedia Technology**
- **Institute of Systems Architecture**
- **Institute of Computer Engineering**
- **Institute of Theoretical Computer Science**

- **Center for Systems Biology**

Coordinating faculty
Examination Office
Track “Visual Computing”
Track “Computational Life Science”
Track “Applied Artificial Intelligence”



Faculty of Mathematics

Institutes and Chairs

- Institute of Algebra
- Institute of Analysis
- Institute of Geometry
- Institute of Mathematical Stochastics
- **Institute of Numerical Mathematics**
- **Institute of Scientific Computing**
- Center for Dynamics

Track “Computational Mathematics”

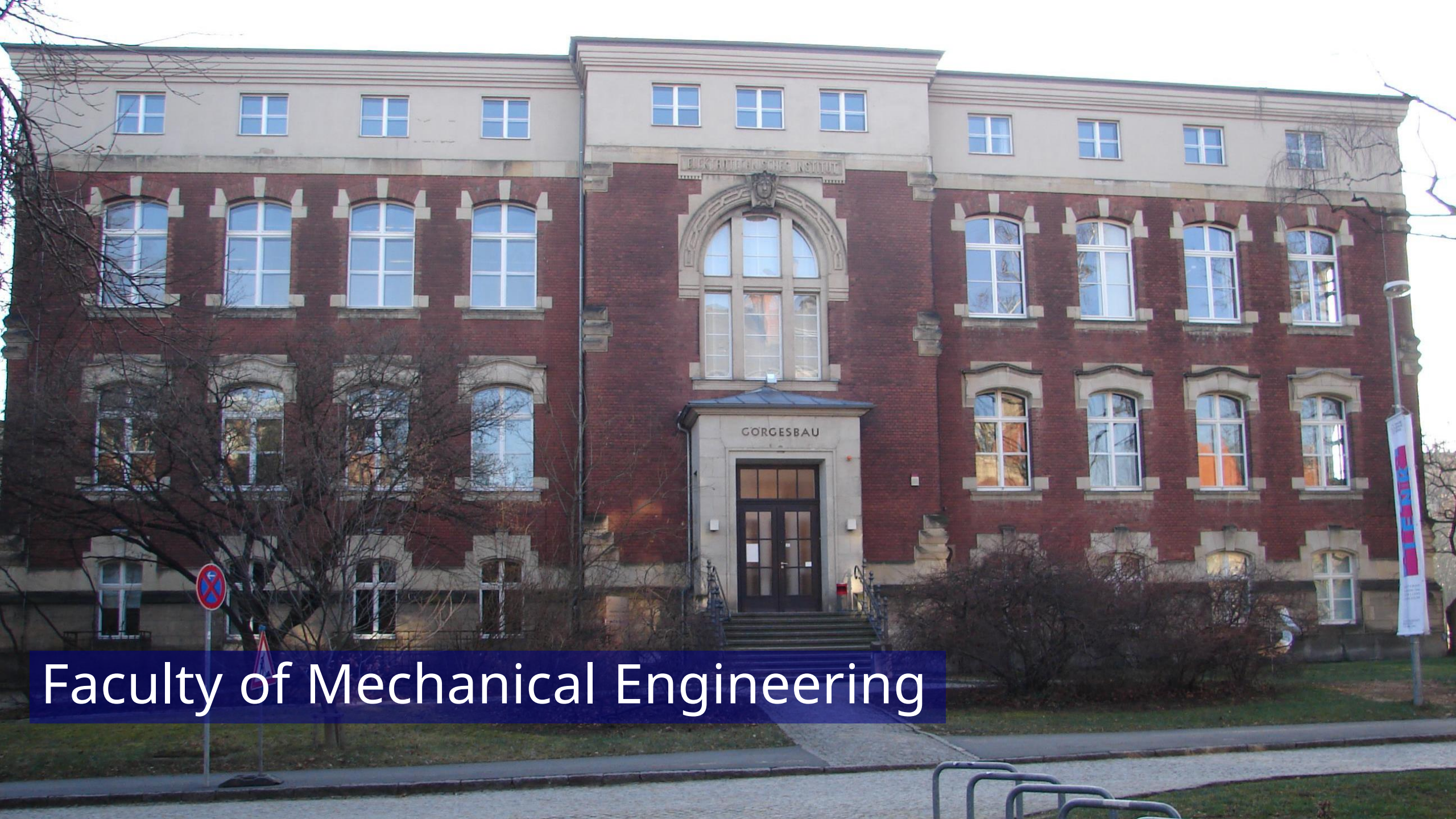


Center for Molecular and Cellular Bioengineering

Institutes and Chairs

- **Biotechnology Center BIOTEC**
- Center for Regenerative Therapies CRTD
- Center for Molecular Bioengineering B-CUBE

Lectures in
“Computational Life Science”



Faculty of Mechanical Engineering

Institutes

- Institute of Aerospace Engineering
- **Institute of Fluid Mechanics**
- Institute of Lightweight Engineering and Polymer Technology
- Institute of Machine Elements and Machine Design
- Institute of Manufacturing Science and Engineering
- Institute of Material Handling and Industrial Engineering
- **Institute of Materials Science**
- Institute of Mechatronic Engineering
- Institute of Natural Materials Technology
- Institute of Power Engineering
- Institute of Process Engineering and Environmental Technology
- **Institute of Solid Mechanics**
- Institute of Textile Machinery and High-Performance Material Technology

Track “Computational Engineering”



Faculty of Electrical and Computer Engineering

Institutes

- **Institute of Acoustics and Speech Communication (IAS)**
- Institute of Electronic Packaging Technology (IAVT)
- **Institute of Automation (IFA)**
- Institute of Electrical Power Engineering (ETI)
- Institute of Electrical Power Systems and High Voltage Engineering (IEEH)
- Institute of Electromechanical and Electronic Design (IFTE)
- Institute of Biomedical Engineering (IBMT)
- **Institute of Circuits and Systems (IEE)**
- **Institute of Communication Technology (IFN)**
- Institute of Solid State Electronics (IFE)
- Institute of Semiconductors and Microsystems (IHM)
- Institute of Control Theory (RST)

Track “Applied Artificial Intelligence”



Faculty of Business and Economics

Chairs

- Auditing and Taxation
- Business Education and Management Training
- **Energy Economics**
- Entrepreneurship and Innovation
- Environmental Management
- Finance and Financial Services
- Management Accounting and Control
- Industrial Management
- Logistics
- Marketing
- Organization
- Strategic Management
- Knowledge and Technology Transfer

Track “Computational Modeling
in Energy Economics”



Faculty of Medicine

Institutes and Chairs

- Institute of Anatomy
- Institute of History of Medicine
- Institute of Immunology
- Institute of Clinical Genetics
- Institute of Clinical Pharmacology
- **Institute of Medical Informatics and Biometry**
- Institute of Medical Microbiology and Hygiene
- Institute of Pharmacology and Toxicology
- Institute of Physiology
- Institute of Physiological Chemistry
- Institute of Pathology
- Institute of Virology
- Institute of Occupational and Social Medicine

Lectures in
“Computational Life Science”



Faculty of Psychology

Institutes and Chairs

- **Institute of General Psychology, Biopsychology, and Methods of Psychology**
- Institute of Clinical Psychology and Psychotherapy
- Institute of Labor, Organizational, and Social Psychology
- Institute of Developmental Psychology and Pedagogics

- Chair of Transportation Psychology

Lectures in
“Computational Life Science”

Computational Modeling and Simulation

Program Overview

CMS Program Study Overview

Compulsory Modules of Basic Education

(25 credits)

Soft skills, literature studies, research project

Elective Compulsory Modules of Basic Education

(15 credits)

Build core computational and methodological skills

Compulsory Modules in the Selected Track

(50 credits)

Fixed advanced modules in chosen field

Master's Thesis and Defense

(30 credits)

Thesis + defense

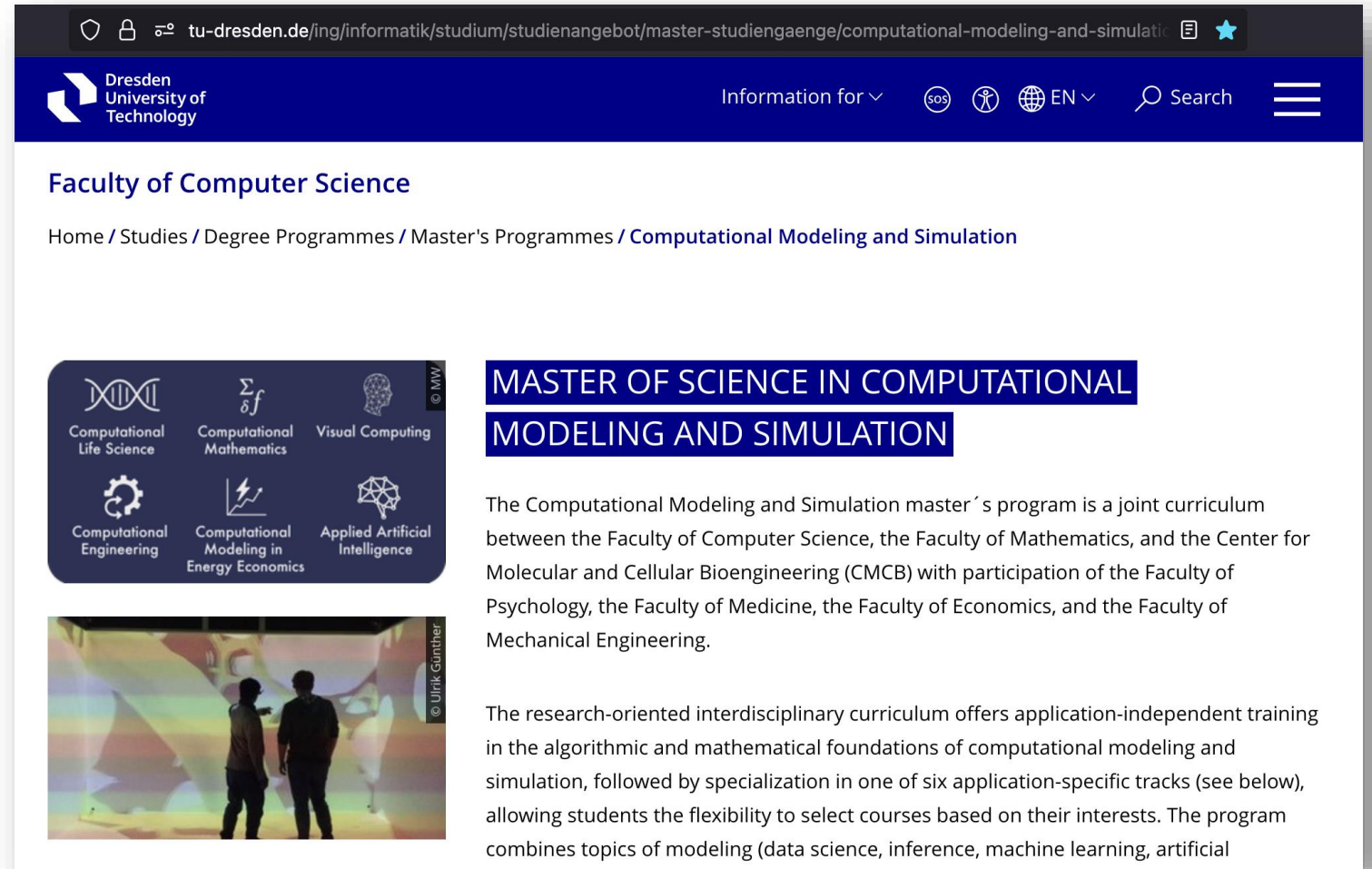
Year Semester			
2	4	Masters Thesis	
	3	Research Project CMS-PRO	Track Specialization
1	2	Literature Studies CMS-SEM	Track Specialization
	1	Soft Skills CMS-SKL	Track Specialization
			Compulsory Elective Modules CMS-COR-*

General: CMS Website

Main entry point for:

- study schedules
- exam regulations
- module descriptions
- etc

<https://tu-dresden.de/ing/informatik/studium/studienangebot/master-studiengaenge/computational-modeling-and-simulation>



General: CMS Website – Study Regulation

Submenu “Regulations”

- study schedules
- exam regulations
- module descriptions
- etc

<https://tu-dresden.de/ing/informatik/studium/studienangebot/master-studiengaenge/computational-modeling-and-simulation/regulations>

The screenshot shows the TU Dresden CMS website. The header includes the TU Dresden logo, navigation links, and a search bar. The main content area is titled 'Faculty of Computer Science' and 'REGULATIONS'. It contains a paragraph about study documents being announced in the 'Amtlichen Bekanntmachungen der TU Dresden'. Below this, it states 'The German versions are legally binding, only!'. The 'Study Regulations' section lists three items: 'Study Regulations' (announced on 5 May, 2018), 'First official amendment' (announced on 11 March, 2020), and 'Second official amendment' (announced on 24 March, 2025). Each item has links to German and English versions. A sidebar menu on the right shows the site's structure, including 'TUD main menu', 'Faculty of Computer Science', 'The Faculty', 'Studies', 'Degree Programmes', 'Bachelor's Programmes', 'Master's Programmes', 'Informatik (discontinuing)', 'Computer Science (starting 10/2025)', 'Media Computer Science', 'Computational Modeling and Simulation', 'Regulations', 'Boards and Commissions', and 'Curriculum'.

Computational Modeling and Simulation

Presentation of Study Tracks

Computational Modeling and Simulation

At a glance Applied Artificial Intelligence

Prof. Björn Andres – CMS-AAI Coordinator

Applied Artificial Intelligence Track – Topics

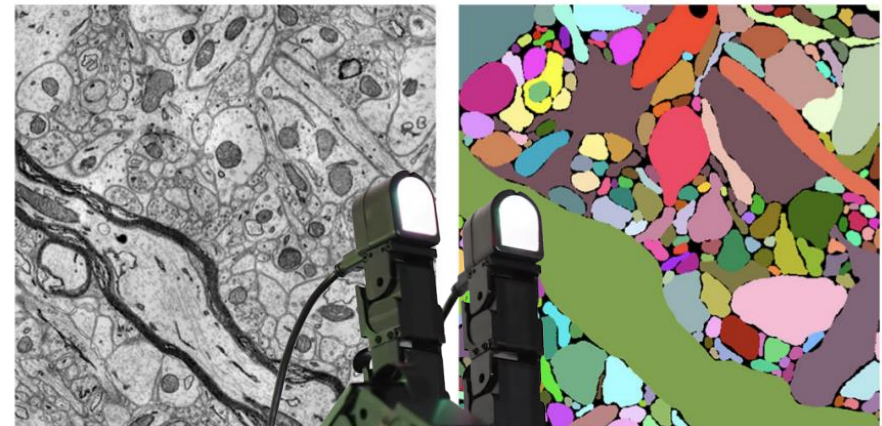
Machine Learning

$$\min_{y \in \mathcal{Y}} \inf_{\theta \in \Theta} \lambda R(\theta) + \frac{1}{|S|} \sum_{s \in S} L(f_{\theta}(x_s), y_s)$$

AI Hardware



Computer Vision



Robotics



Applied Artificial Intelligence Track – Study Path

Term 1:

- 3 core courses (choice from CMS-COR-*)
- Soft skills course (CMS-SKL)
- **Computer Vision** (CMS-AAI-CV)
- **Digital Circuit Technology** (CMS-AAI-DCT)

Term 2:

- 2 seminars (choice from CMS-SEM-*)
- **Machine Learning for Robotics** (CMS-AAI-RL)
- **Deep Neural Network Hardware** (CMS-AAI-DNNH)
- **Applications of Advanced AI** (choice of 4 LHPW from CMS-AAI-AP)
- **Team Project** (choice from CMS-AAI-TEA)

Term 3:

- Research Project (CMS-PRO)
- **Touch Sensing and Processing** (CMS-AAI-TSP)
- **Applications of Applied AI** (choice of 10 LHPW from CMS-AAI-AP)

Term 4:

- Master's Thesis

Applied Artificial Intelligence Track – Mentors

Bjoern Andres



Machine Learning for Computer Vision

Faculty of Computer Science

Christian Mayr



Highly-Parallel VLSI Systems and Neuro-Microelectronics

Faculty of Electrical & Computer Engineering
Faculty of Computer Science

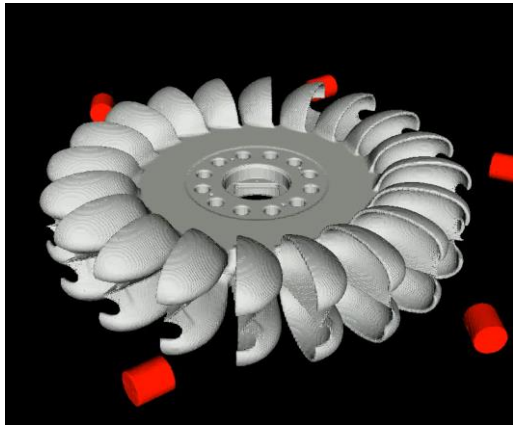
Computational Modeling and Simulation

At a glance Computational Engineering

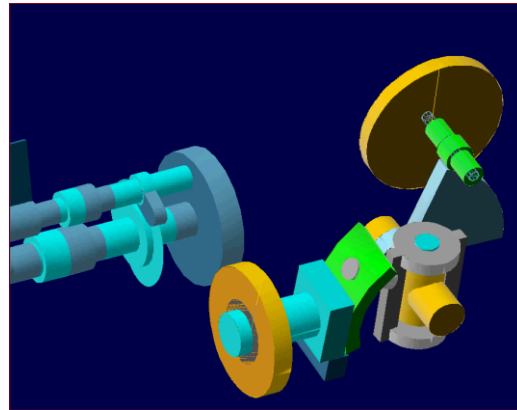
Prof. Michael Beitelschmidt – CMS-CE Coordinator

Computational Engineering

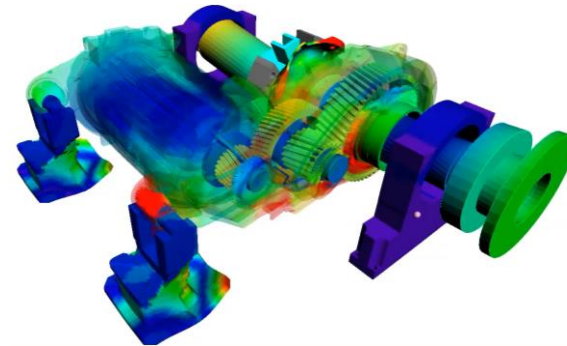
Modeling and simulation is state-of-the-art in modern engineering



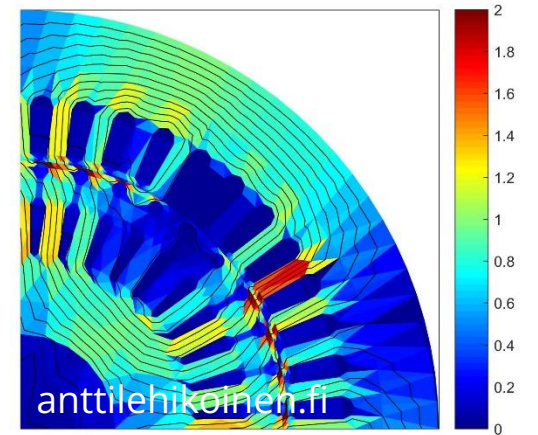
Computational Fluid
Dynamics (CFD)



Multi-Body Dynamics
(MBD)



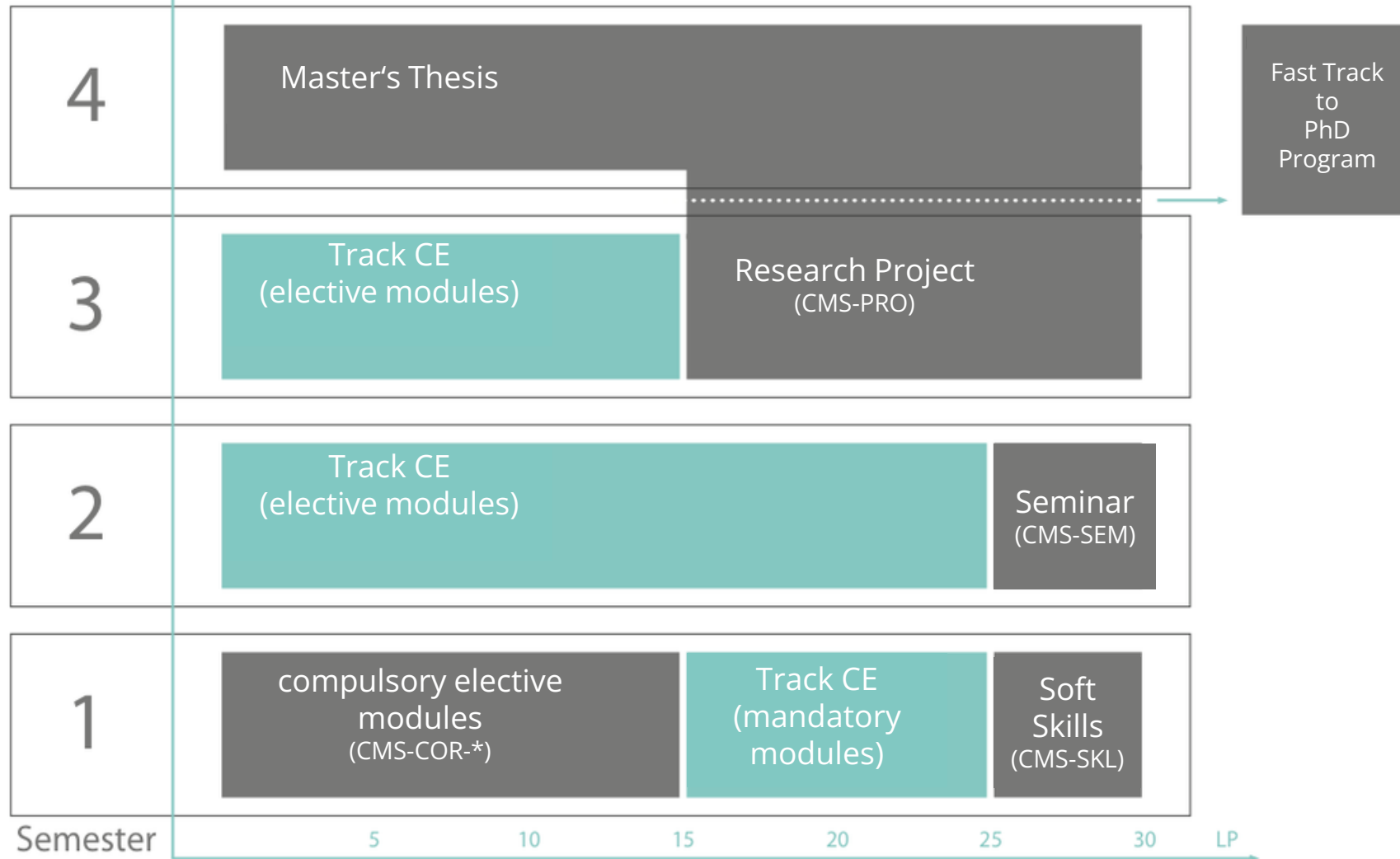
Finite Element Method
(FEM), Structural



Finite Element Method
(FEM),
Electromagnetical

... and many other disciplines

Track Computational Engineering



Track Computational Engineering

Semester 1

Please note the recommendations and comments in the example study paths!

Finite Element
Methods

Computational
Fluid Dynamics

Soft Skills
(CMS-SLK)

compulsory elective modules
Choose 3 from 10
(CMS-COR-*)

Statistical Principles and
Experimental Design

Basic Numerical Methods

Scientific Software Engineering

Machine Learning and
Data Mining

Stochastics and Probability

Parallel Programming and High-
Performance Computing

Foundations of Artificial
Intelligence

Data Visualization

Database Management

Knowledge Models

Track Computational Engineering

Semester 2 & 3

Advanced Topics
in FE Analysis

Multifield
Problems

Multibody
Dynamics

Computational
Engineering
Basics

Computational
Engineering
Advanced

Seminar

Research
Project



Choice from catalog
See recommendations in
[example study paths](#)

Track Coordinator

Prof. Dr. Michael Beitelschmidt

Chair for Dynamics and Mechanism Design
Faculty of Mechanical Engineering



Important reminder:

All Computational Engineering students are invited:

Friday, October, 17th at 2.00 pm

Room: tba

- More details about curriculum
- Electives catalogue
- Mentoring, introduction of mentors
- Q&A

Mentoring System

Mentors



Prof. Dr.-Ing.
Jochen Fröhlich

Chair of Fluid Mechanics



Prof. Dr.-Ing.
Markus Kästner

Chair of Computational
and Experimental
Solid Mechanics



Prof. Dr.-Ing.
Thomas Wallmersperger

Chair of Mechanics of
Multifunctional Structures



Prof. Dr.-Ing.
Michael Beitelschmidt

Chair of Dynamics
and Mechanism Design

Computational Modeling and Simulation

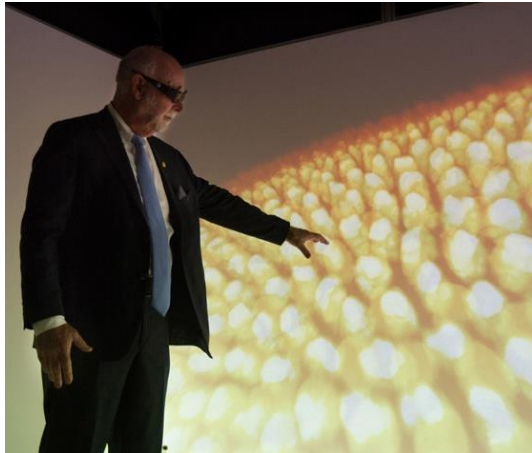
At a glance Computational Life Science

Dr. Nandu Gopan *on behalf of*
Prof. Ivo Sbalzarini – CMS-CLS Coordinator

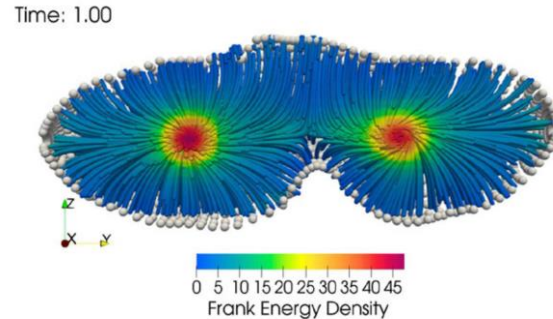
Why Computational Life Sciences track?

„Computer science is for today's life sciences what mathematics is for physics.“

Modeling and simulation define the future of medicine and biology.



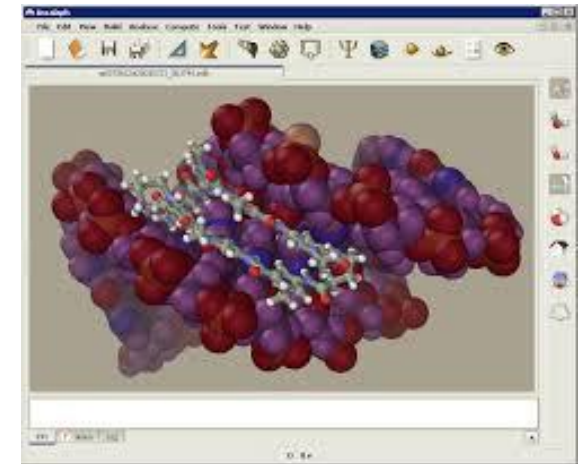
Biomedical Image
Analysis and
Visualization



Simulations of
Biological Systems



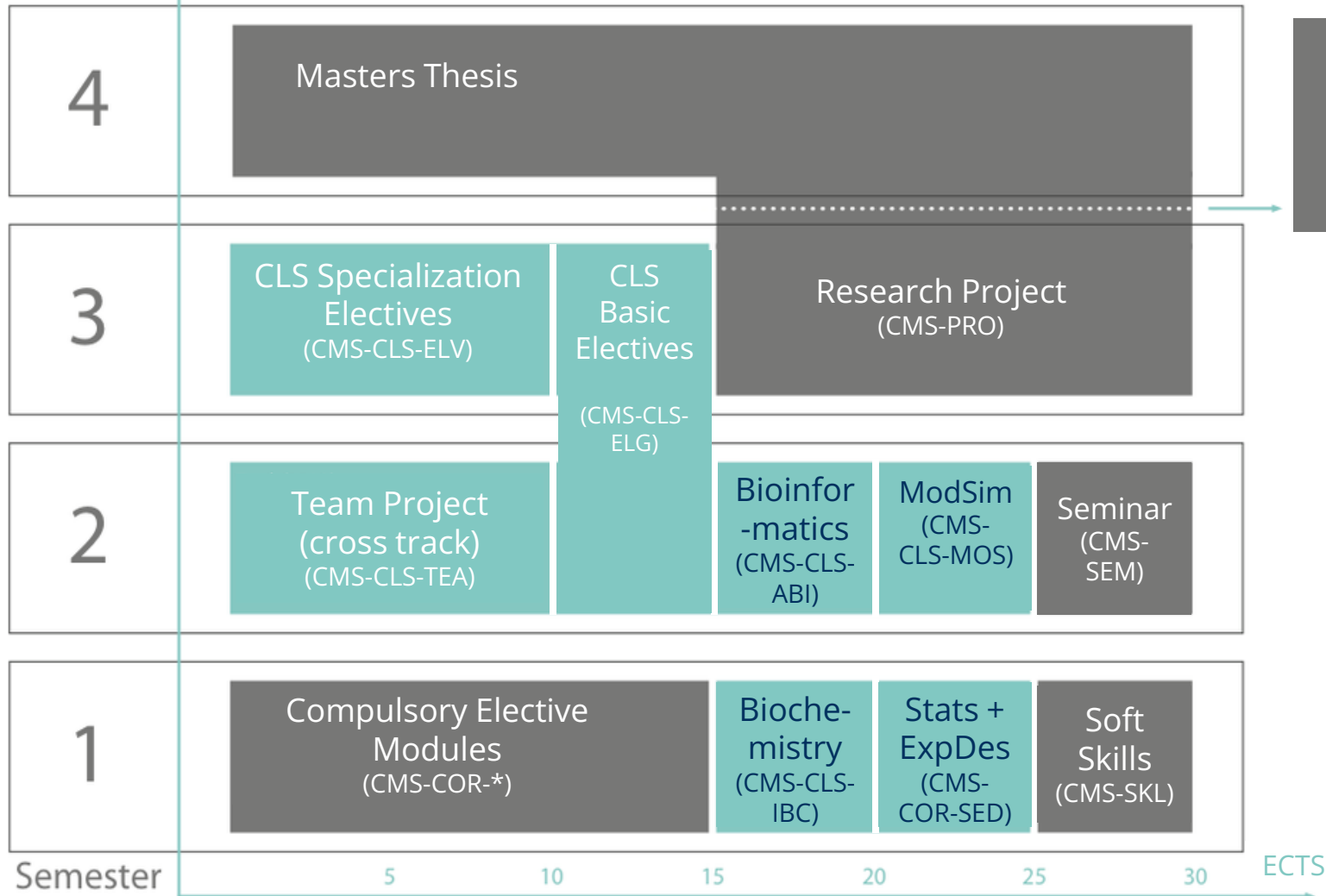
Virtual Surgery/
Personalized Medicine



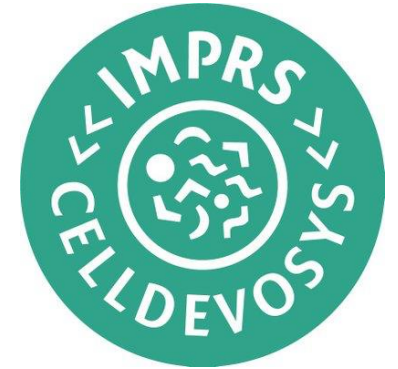
Bioinformatics and
Molecular Modeling

... and many other, like: Computational Neuroscience, Augmented Reality for Medicine, Drug Discovery, ...

The Track: Computational Life Sciences



Fast Track to
PhD Program



Track Mentors

+colleagues from:
Psychology
Medicine
Biology
MPI-CBG
CSBD



Prof. Ingo Roeder

Medical Biometry
and Statistics

Faculty of Medicine



Prof. Ivo Sbalzarini

Scientific Computing for
Systems Biology

Computer Science

Center for Systems
Biology Dresden



Prof. Michael Schroeder

Bioinformatics

BIOTEC / CMCB

Computer Science

Questions?

Please feel free to mail:

nandu.gopan@tu-dresden.de

Dr. Nandu Gopan

CSBD

Pfotenhauerstrasse 108

01307 Dresden



Computational Modeling and Simulation

At a glance Computational Mathematics

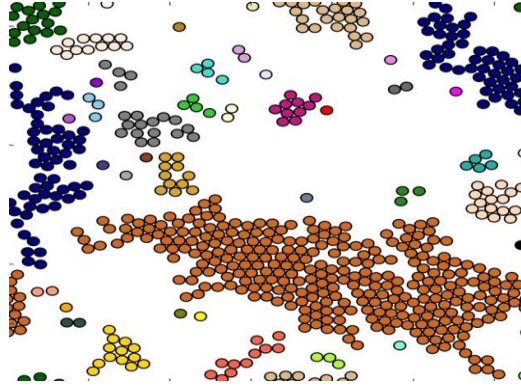
Prof. Axel Voigt – CMS-CMA Coordinator

Computational Mathematics

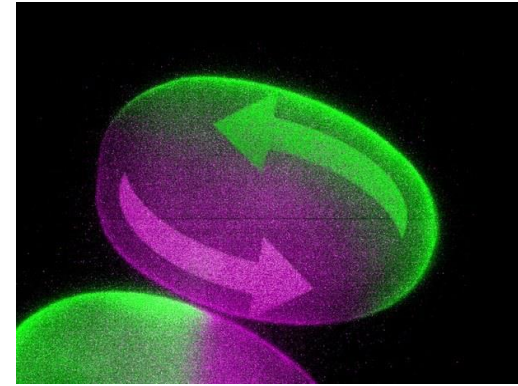
Modeling and simulation next to experiments and theory



Algorithms for High
Performance
Computing



Simulations in Materials
Science

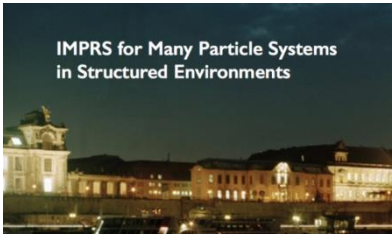
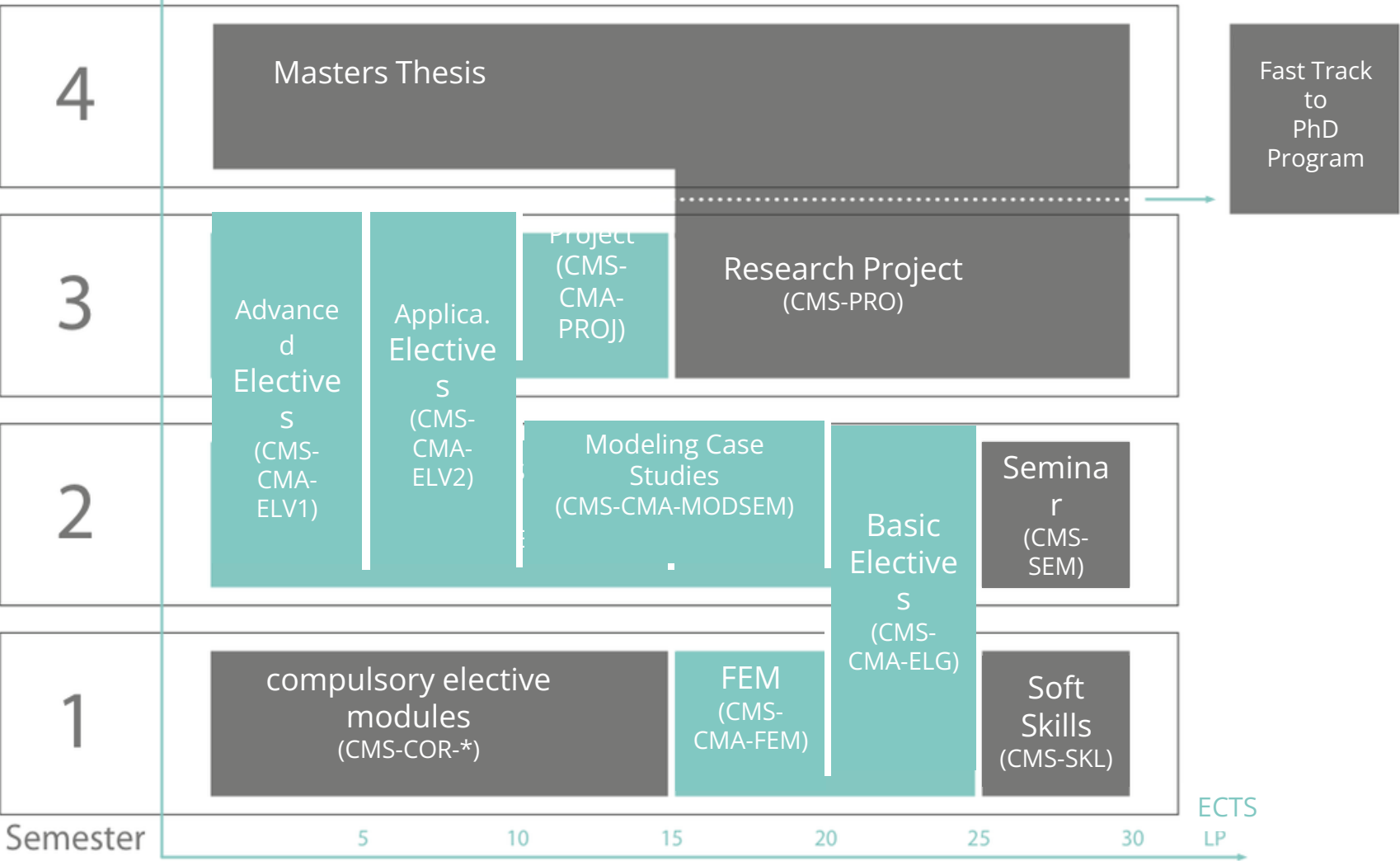


Simulations in Biology
and Biophysics



Computational
Architecture and
Design

Track Computational Mathematics



Track Computational Mathematics

Semester 1

Electives Basics
Part 1

Numerik of Partial Differential Equations, Prof. Matthies

Advanced Concepts of Object-Oriented Computer Languages, Prof. Walter

Computational Fluid Dynamics, Prof. Fröhlich

choice from catalog

Introduction to Mathematical Biology, Prof. Deutsch

Biophysical Methods, Prof. Schlierf

...

Track Mentors



Prof. Dr. Axel Voigt
Chair of Scientific Computing and
Applied Mathematics
Faculty of Mathematics
Center for Systems Biology Dresden



Prof. Dr. Oliver Sander
Chair of Numerics for Partial Differential
Equations
Faculty of Mathematics

Computational Modeling and Simulation

At a glance Visual Computing

Prof. Stefan Gumhold – CMS-CMA Coordinator

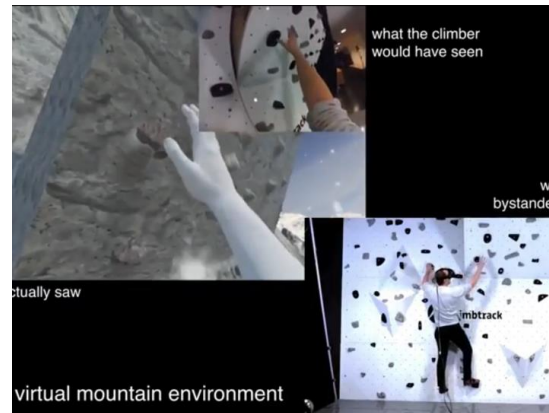
Visual Computing

Modeling and simulation enables Visual Computing applications that change the world



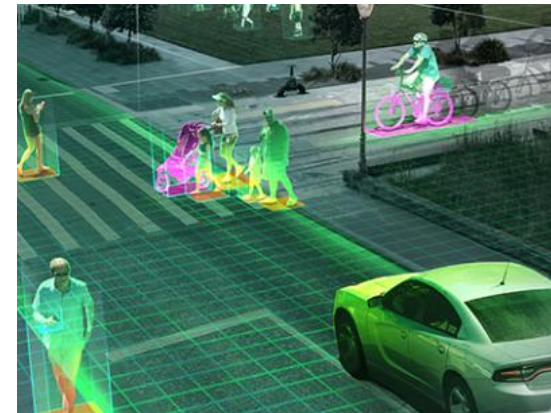
© Marvel Studios, 2018

SFX in Movies



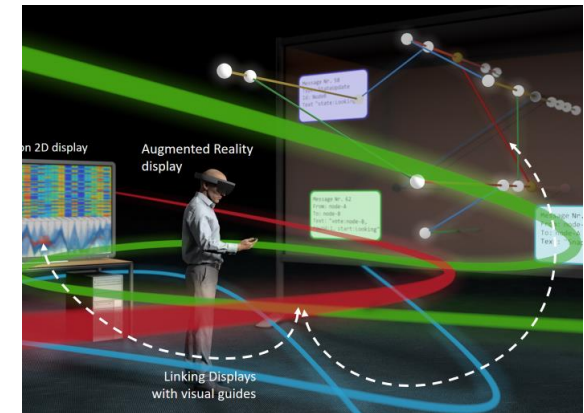
© DFKI, 2018

VR-based Training



© NVIDIA, 2018

Autonomous Driving



© CGV, 2018

Immersive Visual Analytics

... future systems need to combine techniques from computer vision, computer graphics, interaction design, and machine learning

Track Mentors & Contributors



Prof. Dr. Stefan
Gumhold

Chair for
Computer
Graphics and
Visualization

Faculty of
Computer
Science



Prof. Dr.
Raimund
Dachselt

Chair of
Multimedia
Technology, and
Head of
Interactive Media
Lab Dresden

Faculty of
Computer
Science



Prof. Dr. Björn
Andres

Chair for
Machine
Learning for
Computer Vision

Faculty of
Computer
Science



Jun.-Prof. Dr.
Matthew McGinity

Junior
Professorship in
Immersive Media,
and
Head of Immersive
Experience Lab

Faculty of
Computer
Science



Prof. Dr.
Stefanie Speidel

Department for
Translational
Surgical
Oncology

NCT Dresden &
Faculty of
Medicine
Science



Prof. Dr. Roberto
Calandra

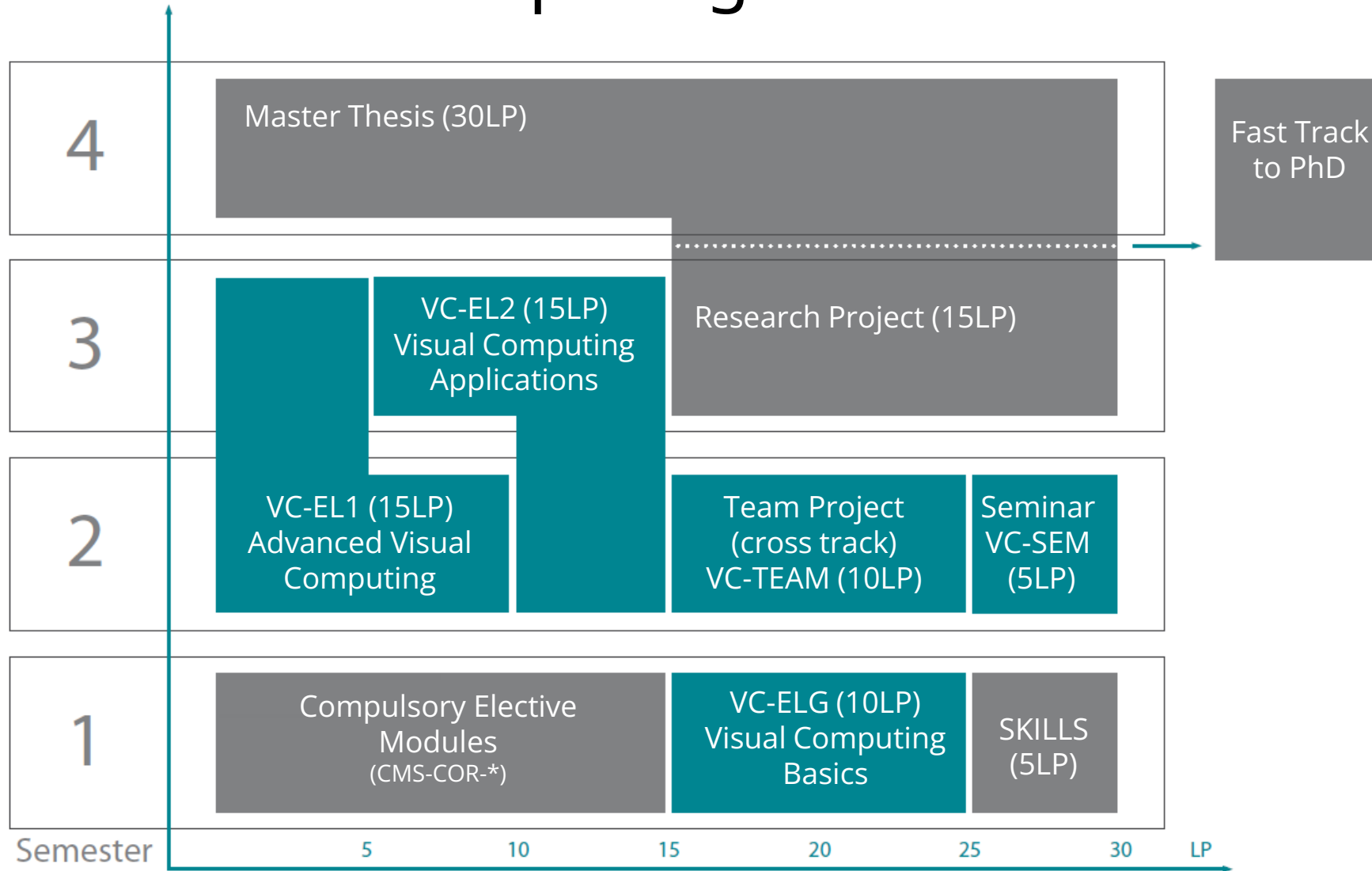
Chair for
Explainable
Artificial
Intelligence
Learning, Adaptive
Systems & Robotics

Faculty of
Computer
Science

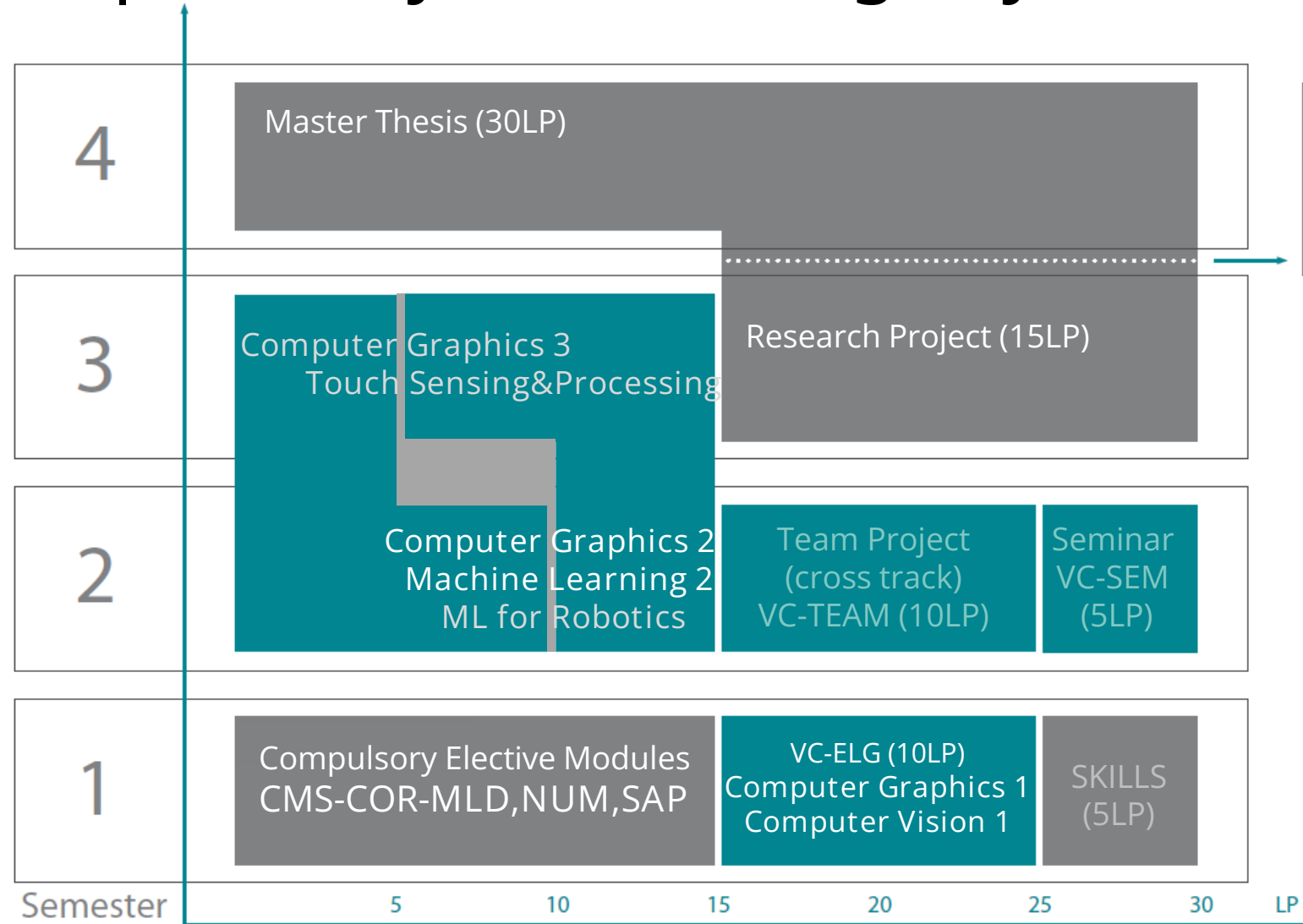
+more
colleagues
from:

CS
Math
Medicine
Biology
MPI-CBG
CSBD

Track Visual Computing



Sample Study Path – Image Synthesis & Understanding



Fast Track
to PhD

Other Sample Study Paths

- 3D Scene Understanding & Interaction
- Interactive Visualization
- Visual Analysis
- Interactive Steering & Exploration
- Augmented Reality

Computational Modeling and Simulation

At a glance

Computational Modeling in Energy Economics

Prof. Dominik Möst – CMS-EE Coordinator

What makes us special?

Systemic aspects of energy supply

Applied energy economics and techno-economic analysis of energy systems

1. Development of models and other methodic approaches to support decision-making in the energy sector

Application on various levels

2. Power plant dispatch & evaluation / integration of RES

3. Transmission & distribution networks, congestion mgmt. & nodal pricing

4. National / inter-national energy systems and markets / market coupling

5. Political / regulatory issues, market design, business models

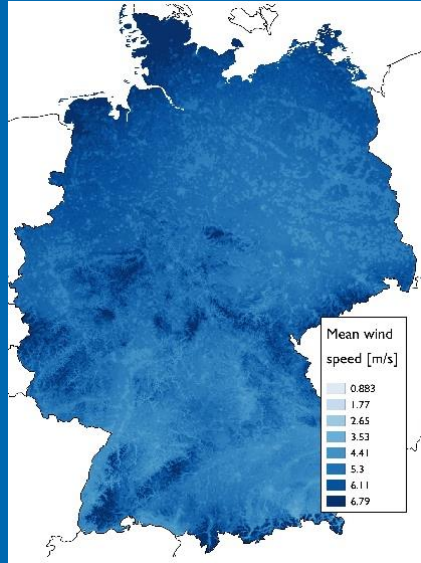


ee²

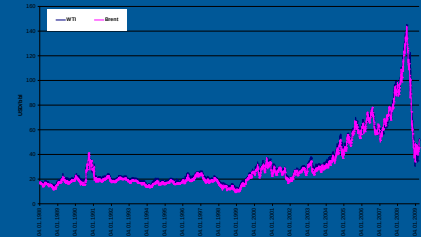
National / international research projects

- H₂-Ready
- MINFRA
- VerSEAS
- DigiTechNetz
- EffiziEntEE

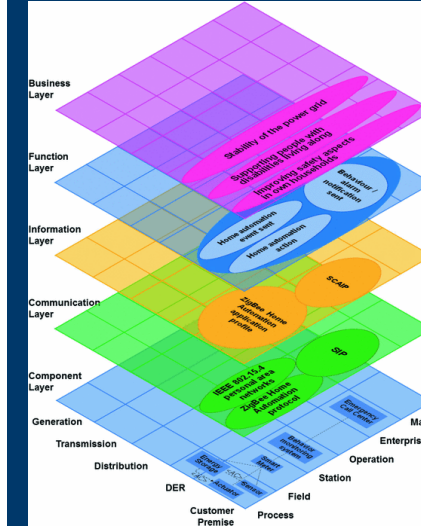
Computational Modeling in Energy Economics



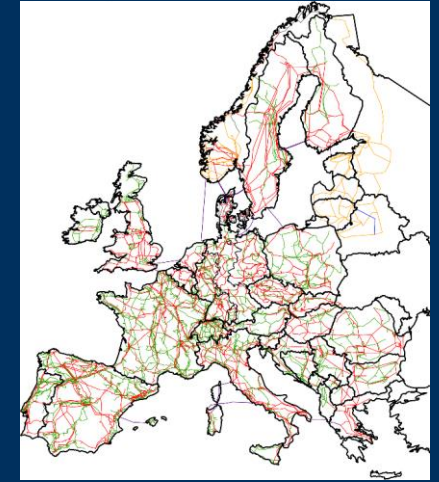
**Data Science in
Energy Economics**



**Market Analyst in
Energy Economics**

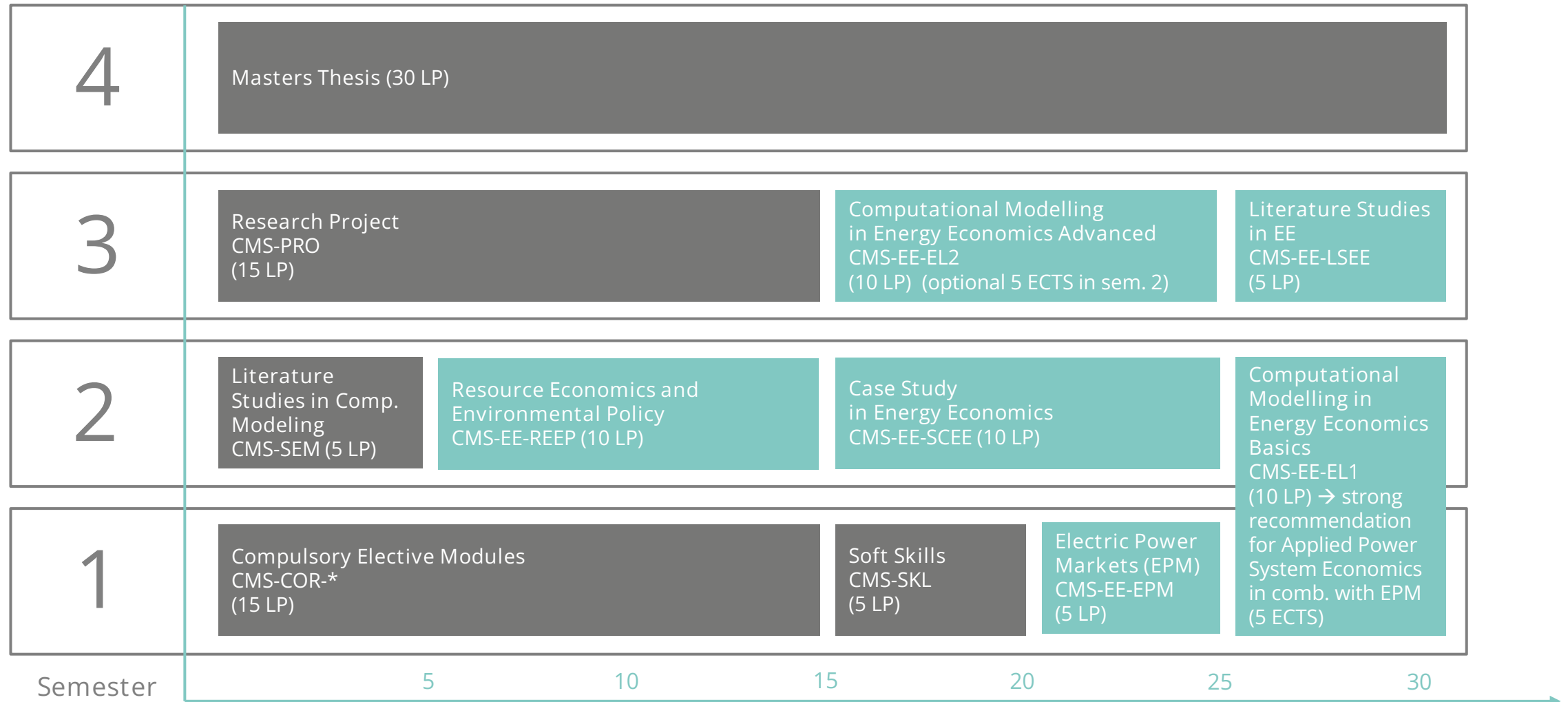


**Software
implementation
for power utilities**

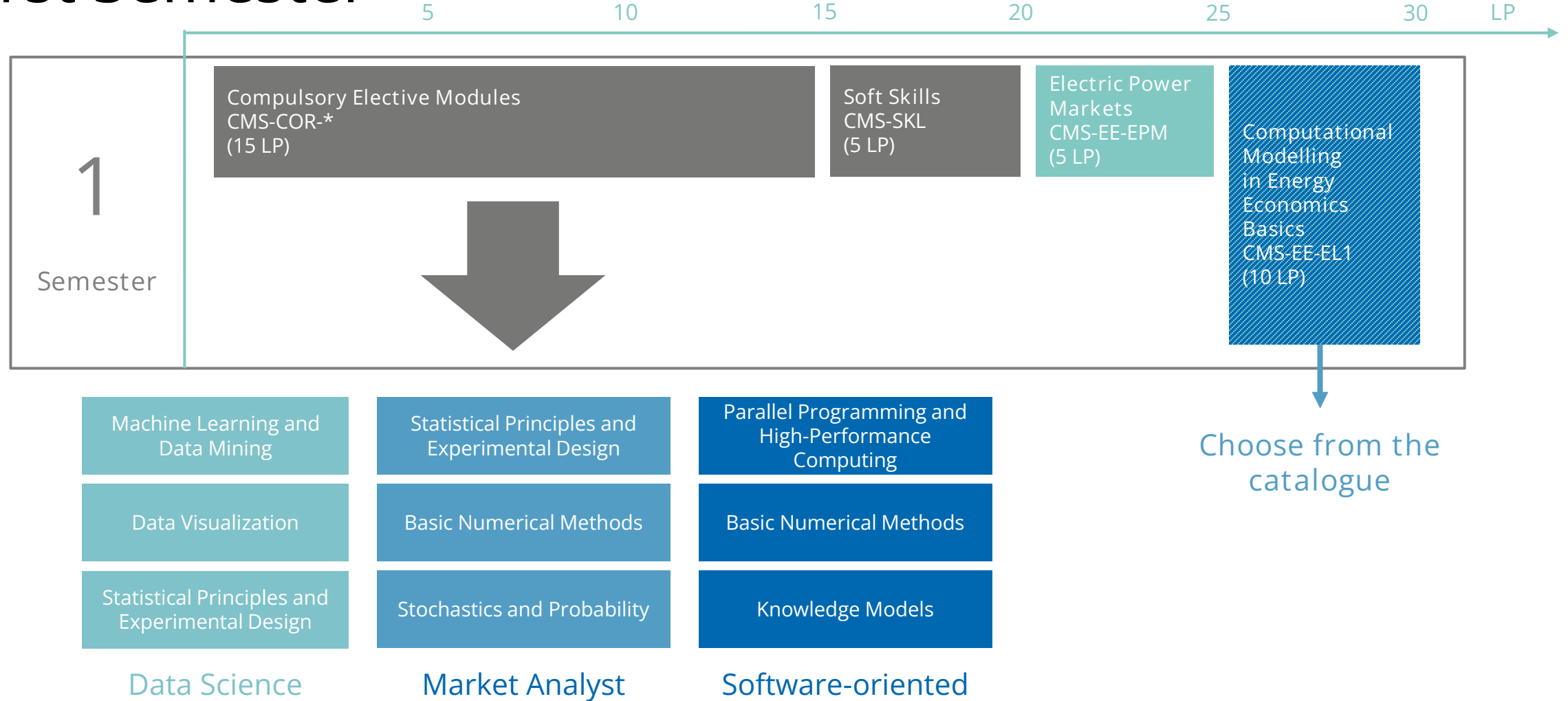


**Data Science and
fundamental
modelling in energy
management**

Track Computational Modeling in Energy Economics



First Semester



Following Semesters

3	Research Project CMS-PRO (15 LP)	Computational Modelling in Energy Economics Advanced CMS-EE-EL2 (10 LP)	Literature Studies in EE CMS-EE-LSEE (5 LP)	
2	Literature Studies in Comp. Modeling CMS-SEM (5 LP)	Resource Economics and Environmental Policy CMS-EE-REEP (10 LP)	Case Study in Energy Economics CMS-EE-SCEE (10 LP)	Computational Modelling in Energy Economics Basics CMS-EE-EL1 (10 LP)
1	Compulsory Elective Modules CMS-COR-* (15 LP)	Soft Skills CMS-SKL (5 LP)	Electric Power Markets CMS-EE-EPM (5 LP)	

- The lecture organized by the chair is offered in both catalogs, but can only be attended once
- Remaining module does not contain further directly energy economic related lectures

!

Choose from the catalogue

Track Mentor



Prof. Dr. Dominik Möst
Chair of Energy Economics
Faculty of Business and Economics

Do you have any questions?

dominik.moest@tu-dresden.de

Or just visit us on

www.ee2.biz

or in person

at **SCH A410**

Computational Modeling and Simulation

Personal Mentoring System

Personal Mentoring System

Every student has been assigned a **mentoring professor** at the time of admission

Typical reasons for contacting your mentor:

- Lecture selection and study planning (**esp. in the beginning!**)
- Identification of suitable institutions of TU Dresden specific requests
- Help when looking for research projects, thesis topics, etc.
- Career advice

Computational Modeling and Simulation

Curricular Module System

General

- There are **modules** and **courses**. They are not the same.
- Modules are worth between 5 and 15 **ECTS credits**.
You will receive credits if you pass the module examination.
- Failed module examinations can be repeated twice. Completed module examinations cannot be repeated.
- **Module descriptions** define modalities.

Study Schedule: Which modules to take when?

For a general overview of study schedule please look at the CMS website:

https://tu-dresden.de/ing/informatik/ressourcen/dateien/cms/ordnungen/Studienablaufplan_2025_EN_SW.pdf

Module No.	Module Name	1. Semester	2. Semester	3. Semester (M)	4. Semester	CP	Total CP
		L/E/S/T/RP/P/LC	L/E/S/T/RP/P/LC	L/E/S/T/RP/P/LC	L/E/S/T/RP/P/LC		
Compulsory Modules of Basic Education							25
CMS-SKL	Soft Skills	2/0/0/0/0/0/2 2 GW				5	
CMS-PRO	Research Project			0/0/0/0/12/0/0 2 GW		15	
CMS-SEM	Literature Studies in Computational Modeling		0/0/4/0/0/0/0 GW*			5	
Elective Compulsory Modules of the Basic Education (3 of 8) (for the track “Computational Life Science” 3 of 7)							15
CMS-COR-MLD	Machine Learning and Data Mining	2/2/0/0/0/0/0 GW				5	
CMS-COR-HPC	Parallel Programming and High-Performance Computing	2/2/0/0/0/0/0 GW				5	
CMS-COR-NUM	Basic Numerical Methods	2/2/0/0/0/0/0 GW				5	

Study Schedule: Which modules to take when?

Generally you need to complete courses from 3 main module categories and the master thesis :

Compulsory Modules of Basic Education	25 credits	Semester 1 - 3
Elective Compulsory Modules of Basic Education	15 credits	Semester 1
Compulsory Modules in the selected track	50 credits	Semester 1 - 3
Master thesis	30 credits	Semester 4

Study Schedule: Example

Compulsory Modules of Basic Education

Module Name		Recommended Course Schedule				Credits	
Module No.	Module Name	1. Semester L/E/S/T/RP/P/LC	2. Semester L/E/S/T/RP/P/LC	3. Semester (M) L/E/S/T/RP/P/LC	4. Semester L/E/S/T/RP/P/LC	CP	Total CP
Compulsory Modules of Basic Education							25
CMS-SKL	Soft Skills	2/0/0/0/0/0/2 2 GW				5	
CMS-PRO	Research Project			0/0/0/0/12/0/0 2 GW		15	
CMS-SEM	Literature Studies in Computational Modeling		0/0/4/0/0/0/0 GW*			5	
Elective Compulsory Modules of the Basic Education							15

- Numbers like 2/0/0/0/0/2 signify lecture hours per week (LHWP)
- Starred * modules contain multiple courses that need to add up to the required LHWP (e.g. CMS-SEM requires taking 2 seminars – 4 LHWP)

Module Description: How many hours are required for the module? What does the exam look like? When is it offered? How is the grade averaged?

https://tu-dresden.de/ing/informatik/ressourcen/dateien/cms/modullisten/modulbeschreibungen_160425_en

Module Number	Module Name	Responsible Lecturer
CMS-COR-NUM	Basic Numerical Methods	Prof. Dr. Ivo Sbalzarini ivo.sbalzarini@tu-dresden.de
Qualification Objectives	Upon completing this module, the students will acquire the basics of numerical mathematics and numerical simulation methods. This includes the theoretical understanding of how a computer calculates with finite floating-point numbers and what kind of errors and inaccuracies may arise from these, and how to reduce or control them same. They will be familiar with basic numerical methods for numerical solutions and simulating mathematic models, linear algebra models, and ordinary and partial differential equations. They will be able to estimate the approximation errors of the methods and determine the algorithmic intensity, and will be able to implement these methods themselves, while adapting and optimising them for specific applications.	

Requirements for the Awarding of Credit Points	The credit points are awarded if the module examination is passed. The module examination consists of a 90-minute written examination. If there are fewer than 10 students registered at the end of the registration period, the written examination may be replaced by an oral examination as an individual examination lasting 30 minutes; if this is the case, this will be announced to the registered students at the end of the registration period.
Credit Points and Grades	5 credit points can be earned by completing this module. The module grade corresponds to the examination grade.
Frequency of the Module	The module is offered each year during the winter semester.

Course Catalogue: Which courses to choose from in a module?

<https://tu-dresden.de/ing/informatik/studium/lehre/lehrangebotskataloge>

CATALOGUE OF TEACHING OFFERS

On this page you will find the course catalogs and course schedules (timetables) of the Faculty of Computer Science.

Courses offered	Course schedules
➡ Winter semester 2025/2026 ----- Subject to changes and additions.	➡ Winter semester 2025/2026 ----- Subject to changes and additions. Please check time and room entries - especially for courses with more than one exercise and for PC pool information - via the course pages of the Chairs.

Course Catalogue: Which courses to choose from in a module?

<https://tu-dresden.de/ing/informatik/studium/lehre/lehrangebotskataloge>

CATALOGUE OF TEACHING OFFERS

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Lehrangebot Wintersemester 2025/2026 - Studiengang Computational Modeling and Simulation, Master, PO 2025

25.09.2025

▼ Pflichtmodul Track Applied Artificial Intelligence

CMS-AAI-AP Applications of Applied Artificial Intelligence

↑ nach oben

Lehrveranstaltung	SWS	Sprache	Dozent	Institut
Biomedical Laser Systems and Optogenetics	2/0/0	englisch	Prof. Czarske	Andere Fakultäten
Computer- und robotergestützte Chirurgie	2/2/0	deutsch	Prof. Speidel	Andere Fakultäten
Computergraphik I	2/2/0	englisch	Prof. Gumhold	Software- und Multimediatechnik
Data Visualization	2/2/0	englisch	Prof. Gumhold, Prof. Dachsel	Software- und Multimediatechnik

Note: There was a recent change to the regulations, so there might be multiple versions, a 2020 and a 2025 version (eg of the study regulations). Always choose the 2025 😊

Computational Modeling and Simulation

Fast Track to PhD

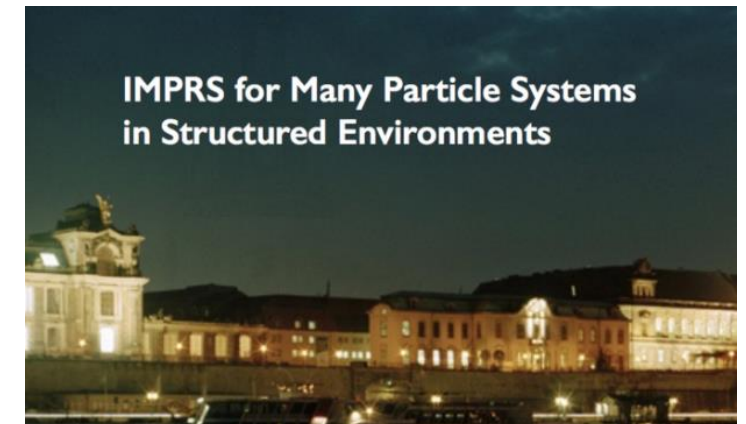
Fast Track to PhD

Opportunity in case you completed your bachelor's degree with **very good** grades and decide by the 3rd semester to continue graduate studies toward a PhD

Procedure

- Undergo the selection process of a doctoral program before the 4th semester
- Join the group of your doctoral advisor in the beginning of the 4th semester as a (paid) doctoral student
- Start working on your PhD project immediately
- Write a Master's thesis as an integral part of your doctoral studies after 22 weeks
- Write a dissertation typically after 3-4 years
- Save ½ year overall

A Selection of Available PhD Programs



Computational Modeling and Simulation

Language Course Offerings

TUDIAS



TU Dresden Foreign Language Courses



TU Dresden Foreign Language Courses

TUDIAS is presented on the CMS-Website (see „study“ language courses)

https://tu-dresden.de/ing/informatik/studium/studienangebot/master-studiengaenge/computational-modeling-and-simulation/Courses_1

Taking a language course is **obligatory** for the module **CMS-SKL**. If you already have C1 in both German and English, you may choose another language.

Winter term 25/26:

Enrollment starts on 1 October 2025.

Consider the dates for the levelling tests.

Places are limited!

Explanatory video provides information about further registration formalities.

Contact: sprachausbildung.tu-dresden.de

Computational Modeling and Simulation

Examination Office

Kerstin Kruse

CMS examination office



Kerstin Kruse

Room: APB-3038; 01069 Dresden

Phone: +49 351 463 38378

Ticket: <https://tu-dresden.de/ing/informatik/studium/examination-office/contact>

The examination office is responsible for the administration of examinations.

CMS examination office

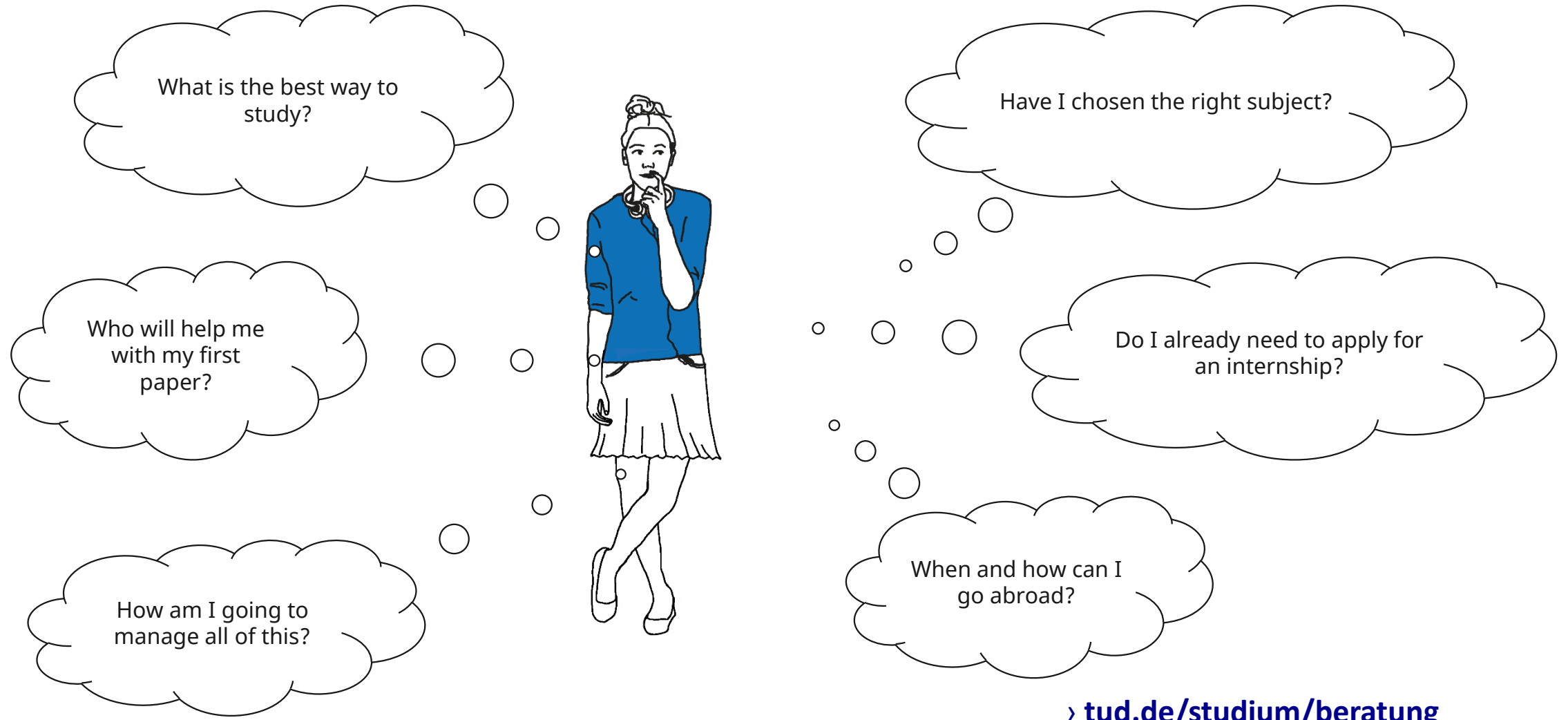
- Information about registration and deregistration for / from **examinations** you will get during registration period via email from the examination office.
- The registration periods you find here:
https://tu-dresden.de/ing/informatik/studium/examination-office/pruefungen_pruefungstermine?set_language=en#section-1
- Registration for courses can be different. Information you will get from each lecturer.
- Please take care that the registration for examinations in Selma is **legally binding!**
- Explanations about Selma will follow later – during registration period.

Directorate 8 – Student Affairs and Continuing Education

Service and Support Offers During Your Studies

Student Orientation WS 2025/2026

Do you have questions about studying?



Central Student Information and Counseling Service

Is there for you in difficult situations. Having doubts or facing problems during your studies?

Offers:

- ✓ Individual Counseling
- ✓ Workshops
- ✓ Early Warning System PASST?!

› tud.de/zsb/studienberatung



Counseling situation © Sven Ellger

Admissions Office & International Office

...if you were educated in Germany (Individuals with a German high school diploma)

› tud.de/imma

... for international students

› tud.de/international

Topics:

- ✓ Re-registration for the following semester, De-registration, Certificates
- ✓ Taking a leave of absence
- ✓ Changing degree programs



Service and support offers Fritz-Foerster-Bau

Career Service

Topics & Offers

- Key Competencies, Presenting skillfully
- Applying successfully
- CV Check & Career Counseling
- Live Streams with employers
- Jobs and Internships
- On-Campus Jobfairs
- Career Orientation

› tud.de/career



Berufs- und Karriereorientierung © Copyright

Funding & Financing

BAföG,
Deutschlandstipendium,
scholarships for gifted
students, part-time jobs
alongside your studies—
there are numerous options
for financing your studies.
Further
Information



Gaining international experience

International Office

- ✓ Incoming: International Tutoring Program, Cultural Office
- ✓ Outgoing: Study abroad

› tud.de/international



Leonardo Büro Sachsen

- ✓ Internship abroad
- › tud.de/leonardo



Studierende in Lehrveranstaltung © André Wirsig

Many other services are available to support you during your studies:

- ✓ Studentenwerk Dresden studentenwerk-dresden.de
- ✓ Study Success Projects tud.de/deinstudienerfolg
- ✓ Student Council tud.de/stura
tud.de/stura/fachschaften
- ✓ Student Advisory Service tud.de/studienfachberatung
- ✓ Counseling Compass tud.de/studium/beratungskompas



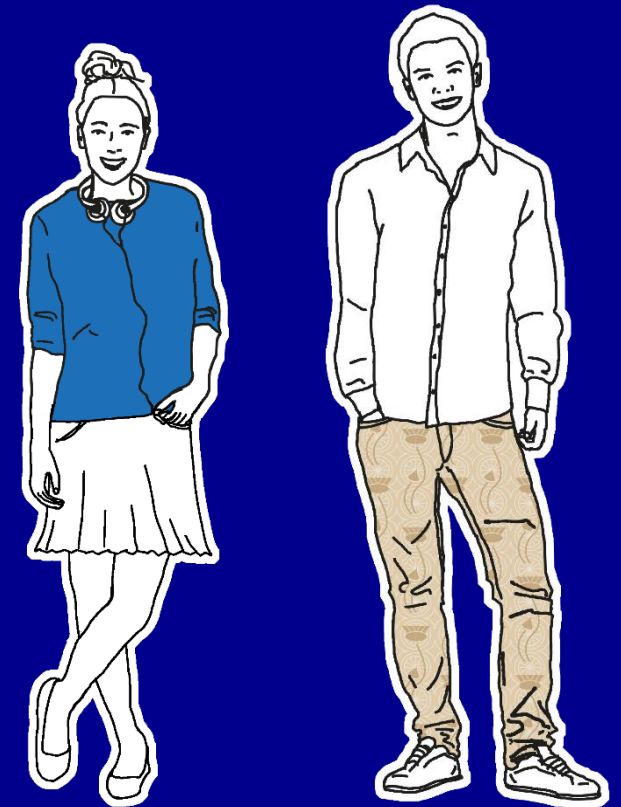
The ServiceCenterStudies supports you with all questions relating to your studies, including Campuscard – by email, phone or in person – we are here to help.

SCS Servicearea, Fritz-Foerster-Bau,
Mommsenstraße 6

scs@tu-dresden.de

+49 351 463 42000

tud.de/studium/beratung



Computational Modeling and Simulation

Complaints Office

Anti-discrimination

Dealing with harrasment, discrimination and violence



Responsibility

Technische Universität Dresden is firmly committed to standing up to harassment, discrimination and violence. This commitment is anchored in its statutes and regulations as well as in corresponding framework plans and concepts. It encourages members or associates of TU Dresden to assume collective responsibility.

According to the ["Guideline for Dealing with Harassment, Discrimination and Violence"](#), both employees and students can report incidents of this kind and TU Dresden is obliged to investigate and prevent (repeated) discrimination.

In order to prevent incidents of harassment, discrimination and violence, TU Dresden offers regular training, education courses and information for students and staff.

TU Dresden participates in various action days, such as the International Day for the Elimination of Gender-Based Violence on November 25, with different measures to raise awareness.

For employees and students either affected or interested in discrimination prevention, there are a number of counselling services offered by various representatives and commissions incl. the Personnel Council, psychological counsellors, the queer peer counselling or the conflict mediators among others.

Complaints Office for Incidents of Harassment, Discrimination, Violence

The TU Dresden Complaints Office is the central point of contact for students, staff and other members of the university who experience or observe discrimination and have questions or need support on the topic of (anti-) discrimination.

The complaints office acts as a counselling, referral and specialist office. Its goal is to reduce discrimination not only on an individual, but also on a institutional and structural level. It is affiliated with the Vice-Rectorate University Culture.

Anyone can contact the complaints office also anonymously or get consultation in English.

Contact: Anja Wiede (cis-femal, white, abled-bodied)

⌘ Mommsenstraße 13, Room 6-234, 01069 Dresden

☎ +49 351 463-33564

✉ beschwerden-diskriminierung@tu-dresden.de

🔗 <https://tu-dresden.de/tu-dresden/universitaetskultur/antidiskriminierung>

Computational Modeling and Simulation

Core Values and Guiding Principles

**Please read
them!**

**You
subscribed
to them with
your
registration**

CORE VALUES AND HELP

Core Values and Guiding Principles

In accordance with the >[Mission Statement of TU Dresden](#), the master's program "Computational Modeling and Simulation" stands for and maintains the following values and guiding principles.



The M.Sc. program "Computational Modeling and Simulation" embodies an **interdisciplinary, cooperative, and inclusive spirit, built on the foundation of diversity**. Its members and students value and foster diversity of nationalities, social backgrounds, geographic origins, ethnicities, scientific disciplines, gender, sexual orientation, age, beliefs, values, lifestyles, physical ability, opinions, perspectives, and thoughts. We strongly believe that diversity is a prerequisite for creativity in research and teaching, and we recognize its importance. We vouch for a **family-friendly atmosphere of fairness, equality, and mutual respect in a diverse group of people**.

Help

A list of **Contacts** for Help and Reporting is published on the CMS website:

<https://tu-dresden.de/ing/informatik/studium/studienangebot/master-studiengaenge/computational-modeling-and-simulation/core-values>

The **Helpline Dresden**

is an emergency phone number that can be called 24/7 in English and German in any urgent or dangerous situation, and at certain times in Arabic as well.

.... just dial **0351 – 850 75 222**.

A brief Overview

The iFSR – Your Student Representatives

Eliah Lohr
Fachschaftsrat Informatik

What is the iFSR?



Services

We answer questions about your studies and are your representatives

Online Services

- Website
 - FTP Server with former exams
 - programming courses
- Social Media
 - Information about current events

Office (APB E017)

- items that can be rented
- printing service



Welcome to the website of the Student Council of Computer Science in Dresden

Your student council is here to empower your studies through
collaboration, help, and community engagement.

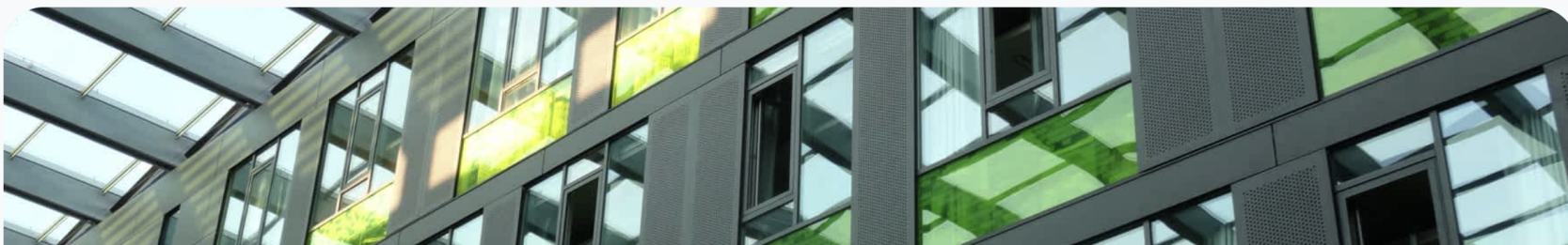
[learn more](#)

[contact us](#)

 [ESE Website](#)

 [Events](#)

 [News](#)



Events

- Weekly meeting in which the entire iFSR comes together
- Barbeques
- Game Nights in the Department
- First Semester Introduction week
- Supportive work for department events such as the long night of sciences and the university day

...



We want YOU!

