Kooperation Agreement

TU Wien - UFRGS since 2006

Markus Tomaselli 2018 FAUBAI
1815  Founded as „k. k. polytechnisches Institut"
1919  Admission for women
1975  Renamed to „Technische Universität“ (TU)
2015  200-year-anniversary
Research at TU Wien –
From Basic Research to Applications
Research

Five Research Focus Points:

- Computational Science and Engineering
- Quantum Physics and Quantum Technologies
- Materials and Matter
- Information and Communication Technology
- Energy and Environment

Additional Fields of Research:
www.tuwien.ac.at/forschung/forschungs_schwerpunkte/additional_fields
Research

Cooperation | Overview 1/2

• On campus
  • Cooperation & research centres connecting faculties
  • TU doctoral programmes

• With Austrian universities
  • TU Austria (Graz University of Technology, University of Leoben)
  • Vienna Scientific Cluster (University of Vienna, University of Natural Resources and Life Sciences, University of Innsbruck, Graz University of Technology, University of Leoben, Alpen-Adria-Universität Klagenfurt)

Cooperation | Overview 2/2

- **Bi- und multilateral**
  - Christian Doppler-Labors
  - FWF doctoral programmes
  - National research networks of the FWF
  - Special research fields of the FWF
  - COMET programmes of the FFG
  - Laura Bassi Center
  - Ludwig Boltzmann Institute

- **Economy**
Infrastructure

• X-ray Center (XRC)
• Analytical Instrumentation Center (AIC)
• NMR-Spectroscopy Center
• TRIGA Mark-II (Reactor)
• Center for Micro- and Nanostructures (ZMNS)
• VSC - Vienna Scientific Cluster, High Performance Computing
• USTEM - Center for Electron Microscopy
• Low Temperature Facilities
Teaching at TU Wien – Imparting Competence
Teaching

Teaching at TU Wien

The education offered by the TU Wien is rewarded by high international and domestic recognition. The chances for graduates for getting an attractive employment are very prosperous. The high demand for graduates of the TU Wien from economy and industry, governmental as well as research institutions are manifest evidence for this.

Wide Range of Studies

The TU Wien offers 18 bachelor-, 31 master- and 3 doctoral programs. Since October 1, 2006, the study programs have been taught as bachelor and master programs, according to the Bologna process.
## Bachelor Programs

**Architecture**  
Architecture (033 243)

**Civil Engineering**  
Civil Engineering and Management of Infrastructure (033 265)

**Electrical Engineering and Information Technology**  
Electrical Engineering and Information Technology (033 235)

**Computer Sciences**  
Media Informatics and Visual Computing (033 532)  
Medical Informatics (033 533)  
Software & Information Engineering (033 534)  
Computer Engineering (033 535)

**Mechanical Engineering**  
Mechanical Engineering (033 245)

**Regional Planning and Development**  
Regional Planning and Development (033 240)

**Technical Chemistry**  
Technical Chemistry (033 290)

**Technical Mathematics**  
Technical Mathematics (033 201)  
Statistics and Mathematics in Economics (033 203)  
Financial and Actuarial Mathematics (033 205)

**Technical Physics**  
Technical Physics (033 261)

**Chemical and Process Engineering**  
Chemical and Process Engineering (033 273)

**Surveying and Geoinformation**  
Geodesy and Geomatics Engineering (033 221)

**Business Informatics**  
Business Informatics (033 526)

**Mechanical Engineering - Economics**  
Mechanical Engineering - Management (033 282)
Teaching

Master Programs 1/2

Architecture
Architecture (066 443)
Building Science and Technology (066 444)

Civil Engineering
Civil Engineering (066 505)
Infrastructural Management (066 510)

Biomedical Engineering
Biomedical Engineering (066 453)

Electrical Engineering
Energy Systems and Automation Technology (066 506)
Telecommunications (066 507)
Microelectronics and Photonics (066 508)
Embedded Systems (066 504)

Across faculties
Materials Sciences (066 434)
Biomedical Engineering (066 453)

Computer Sciences
Double degree programme "Computational Logic Erasmus-Mundus)" (066 011)
Computational Intelligence (066 931)
Visual Computing (066 932)
Media Informatics (066 935)
Medical Informatics (066 936)
Software Engineering & Internet Computing (066 937)
Computer Engineering (066 938)

Mechanical Engineering
Mechanical Engineering (066 445)

Regional Planning
Regional Planning and Development (066 440)
Teaching

Master Programs 2/2

Technical Chemistry
Technical Chemistry (066 490)
Chemistry and Technology of Materials (066 658)

Technical Mathematics
Technical Mathematics (066 394)
Statistics & Mathematics in Economics (066 395)
Financial and Actuarial Mathematics (066 405)

Technical Physics
Physical Energy and Measurement Engineering (066 460)
Technical Physics (066 461)

Chemical and Process Engineering
Chemical and Process Engineering (066 473)

Surveying and Geoinformation
Geodesy and Geomatics Engineering (066 421)
International Programm Cartography (066 200)

Business Informatics
Business Informatics (066 926)

Mechanical Engineering - Economics
Mechanical Engineering – Management (066 482)
Teaching

Doctoral Programmes

TU Wien offers three doctoral programs

• Doctoral Program in Technical Sciences („Dr. techn.“)
• Doctoral Program in Natural Sciences („Dr. rer.nat.“)
• Doctoral Program in Social and Economic Sciences („Dr. rer.soc.oec.“)
### Teaching

#### Students 1/2

<table>
<thead>
<tr>
<th>Program</th>
<th>30.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>5,903</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
<td>363</td>
</tr>
<tr>
<td>Business informatics</td>
<td>996</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>2,476</td>
</tr>
<tr>
<td>Computational Logic</td>
<td>6</td>
</tr>
<tr>
<td>Computer Sciences Management (discontinued)</td>
<td>13</td>
</tr>
<tr>
<td>Economics – Mechanical Engineering</td>
<td>2,034</td>
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<tr>
<td>Electrical Engineering</td>
<td>2,791</td>
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<tr>
<td>Individual Studies</td>
<td>28</td>
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<tr>
<td>Informatics</td>
<td>5,524</td>
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</table>
Teaching

Students 2/2

<table>
<thead>
<tr>
<th>Program</th>
<th>absolut</th>
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</thead>
<tbody>
<tr>
<td>Material Science</td>
<td>91</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>2,314</td>
</tr>
<tr>
<td>Process Engineering</td>
<td>721</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>1,268</td>
</tr>
<tr>
<td>Surveying and Geoinformation</td>
<td>357</td>
</tr>
<tr>
<td>Teacher Trainings</td>
<td>208</td>
</tr>
<tr>
<td>Technical Chemistry</td>
<td>1,549</td>
</tr>
<tr>
<td>Technical Mathematics</td>
<td>1,451</td>
</tr>
<tr>
<td>Technical Physics</td>
<td>1,953</td>
</tr>
</tbody>
</table>

Mobility
Mobility

International cooperations and mobility

**Partner universities**
The TU Wien has bilateral agreements with more than 70 universities around the world.

Membership in **international associations**:

- **EUA** (European University Association)
- **SEFI** (European Society for Engineering Education)
- **CESAER** (Conference of European Schools for Advanced Engineering Education)
- **IACEE** (International Association for Continuing Engineering Education)
- **TIME** (Top Industrial Managers for Europe)
- **GE3** (Global Education for European Engineers and Entrepreneurs)

Membership in **academic networks**:

- **ASEA-Uninet** (Southeast Asia)
- **Eurasia-Pacific Uninet** (China, Central Asia, Russia)
- **ATHENS** (Advanced Technology Higher Education Network)
- **4 x TU** (TU Bratislava, TU Budapest, TU Prag, TU Wien)
- **Technical Universities of European Capitals**
Mobility

Membership in international subject-specific academic networks:

• EUPEN (European Physics Education Network)
• ECTN (European Chemistry Thematic Network)
• LE:NOTRE (Thematic Network in Landscape Architecture)

Mobility and scholarship programmes:

• ERASMUS (Mobility of students and teaching staff: EEA-countries, 250 bilateral agreements)
• ERASMUS Mundus (Mobility of students, graduate students, teaching staff: Russia)

• Joint Study (Mobility of students: USA, CAN, Australia, Latin America, Russia, Southeast Asia)
• CEEPUS (Mobility of students and teaching staff: East and Southeast Europe)

International Study Programs:

• European Masters Program in Computational Logic (Erasmus Mundus)
• Double-, Joint-Degrees: Ecoles Centrales, INSA Lyon, Universidad Politécnica de Madrid, Politecnico di Milano, UACG Sofia, Tongji University, Shanghai
• Master Program taught in English: Biomedical Engineering
  Building Science and Technology
• TUW-Summer University
## Organisation

<table>
<thead>
<tr>
<th>Faculties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture and Planning</td>
</tr>
<tr>
<td>Civil Engineering</td>
</tr>
<tr>
<td>Electrical Engineering and Information Technology</td>
</tr>
<tr>
<td>Informatics</td>
</tr>
<tr>
<td>Mechanical and Industrial Engineering</td>
</tr>
<tr>
<td>Mathematics and Geoinformation</td>
</tr>
<tr>
<td>Physics</td>
</tr>
<tr>
<td>Technical Chemistry</td>
</tr>
</tbody>
</table>
Location
Location

A  Campus Karlsplatz
(4., Karlsplatz 13)

B  Campus Getreidemarkt
(6., Getreidemarkt)

C  Campus Gußhaus
(4., Gußhausstraße 25-29)

D  Campus Freihaus
(4., Wiedner Hauptstraße 8-10)

E  Campus Favoritenstraße
(4., Favoritenstraße 9-11)

F  Science Center
(3., Franz-Grill-Straße 3)
# Facts & Figures 1/2

<table>
<thead>
<tr>
<th>Finances*</th>
</tr>
</thead>
<tbody>
<tr>
<td>357 Mio. € turnover</td>
</tr>
<tr>
<td>233 Mio. € balance sheet total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 9,000 rooms</td>
</tr>
<tr>
<td>290,000 m² total area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Staff*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,602 scientific staff</td>
</tr>
<tr>
<td>1,140 non-scientific staff</td>
</tr>
<tr>
<td>4,783 total staff</td>
</tr>
</tbody>
</table>

Sources: * Balance of Accounts 2016
### Facts & Figures 2/2

#### Library*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4 Mio.</td>
<td>book stocks</td>
</tr>
<tr>
<td>&gt; 3,8 Mio.</td>
<td>Web-Server/Access to library services (virtual visits)</td>
</tr>
</tbody>
</table>

#### Students**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>29,377</td>
<td></td>
</tr>
<tr>
<td>thereof 28.2%</td>
<td>women</td>
</tr>
</tbody>
</table>

#### Alumni**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3,098</td>
<td>first and second degrees</td>
</tr>
<tr>
<td>thereof 1,496</td>
<td>bachelor programs</td>
</tr>
<tr>
<td>thereof 1,100</td>
<td>master programs</td>
</tr>
<tr>
<td>thereof 190</td>
<td>diploma programs</td>
</tr>
<tr>
<td>thereof 312</td>
<td>doctoral programs</td>
</tr>
</tbody>
</table>

*Sources: *Library (2016), **Knowledge Balance Sheets 2016*
UFRGS/TU-WIEN Agreement

Established 2006
Globalization Tensions

The public is divided and conflicted about the consequences of globalization and many are fearful of its seeming inevitable growth.

As higher education is pulled more and more into cross-border activity and global standards and priorities,
- Do the public begin to wonder also if their higher education systems at home remain in service to THEM and THEIR best interests?

The public and policy makers want greater accountability from H.E.
- And this is usually first in terms of local and national needs.

Globalization makes it critically important that H.E. institutions help communities bridge the local and global,
- Providing knowledge, skills and access to global opportunities.
- This is MISSING in the ranking criteria.

Hudzik, NAFSA, 2016 and 2017
Transformative Infrastructures
EXKURSION BRASIL

14.01.16 – 05.04.16
São Paulo – Brasilien – Rio de Janeiro
Curitiba – Florianopolis – Porto Alegre

São Paulo
14.01.16
Arrival of São Paulo
15.01.16
Visit to Ibirapuera by Vincenzo Aragona
SEF TV Lecture by João Bonek – Lunch Memorial da América Latina
16.01.16
Vaticano, Basílica de São Pedro, Museo Vaticano, Basílica de São Paulo, Prado, Panteão Vaticano
7.01.16
Seminário de Desenvolvimento Sustentável
Exposição de Casa São Paulo
Beira Rio – Morro da Cachoeira – Design House
Crianças da Bahia – Bairro de São Cristóvão
Brasília
15.01.16
Transfer to Brasília
Santana do Parana
Santuário da Aparecida
19.01.16
Evangelical Church of Justice
Ambassador of Justice
Pretorium – Brasília
Pantanal do Largo Sul
20.01.16
Capela da Paróquia – São Pedro da Aldeia, Brasília
21.01.16
Santander in Brasília
Transfer to Belo Horizonte

Belo Horizonte
22.01.16
Praça da Liberdade
Botanical Garden – Botanical Museum
Minas Gerais – The Home of Coffee
23.01.16
Transfer to Rio de Janeiro
Largo de São Francisco
Jardim do Mar

Rio de Janeiro
26.01.16
City Center
27.01.16
Artpark, Niterói
30.01.16
Exponential, Exponential
31.01.16
Workshop (EMIS)
03.02.16
City Center
04.02.16
Buck Tooth
05.02.16
Flights to Vienna
## Smartness/Livability

<table>
<thead>
<tr>
<th>Smartness rankings &amp; some of their favorite cities</th>
<th>Livability rankings &amp; some of their favorite cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juniper Research “Global Smart City”</td>
<td>Economist “Global Livability Ranking”</td>
</tr>
<tr>
<td>1 Barcelona Spain</td>
<td>1 Melbourne Australia</td>
</tr>
<tr>
<td>2 New York City USA</td>
<td>2 Vienna Austria</td>
</tr>
<tr>
<td>3 London Great Britain</td>
<td>3 Vancouver Canada</td>
</tr>
<tr>
<td>4 Nice France</td>
<td>4 Toronto Canada</td>
</tr>
<tr>
<td>5 Singapore Republic of Singapore</td>
<td>5 Calgary Canada</td>
</tr>
<tr>
<td>Fast Company “Top 10 Smart Cities”</td>
<td>Mercer “Quality of Living Survey”</td>
</tr>
<tr>
<td>1 Vienna Austria</td>
<td>1 Vienna Austria</td>
</tr>
<tr>
<td>2 Toronto Canada</td>
<td>2 Zurich Austria</td>
</tr>
<tr>
<td>3 Paris France</td>
<td>3 Auckland New Zealand</td>
</tr>
<tr>
<td>4 New York City USA</td>
<td>4 Munich Germany</td>
</tr>
<tr>
<td>5 London Great Britain</td>
<td>5 Vancouver Canada</td>
</tr>
</tbody>
</table>
UFRGS/TU-WIEN Capacity Building

Sustainable, Resilient and Smart: a new perspective for the cooperation between Brazilian and European universities and cities.
5 Overview of objectives and policy areas

Smart City Wien combines the three essential and interlinked basic elements of resources (resource preservation), quality of life and innovation. In this way, it builds on typical strengths of Vienna and includes externally imposed binding goals.

The definition of Smart City Wien:

Smart City Wien defines the development of a city that assigns priority to, and interlinks, the issues of energy, mobility, buildings and infrastructure. In this, the following premises apply:

- radical resource preservation
- development and productive use of innovations/new technologies
- high and socially balanced quality of life

This is to safeguard the city's ability to withstand future challenges in a comprehensive fashion. The elementary trait of Smart City Wien lies in the holistic approach pursued, which comprises novel mechanisms of action and co-ordination in politics and administration as well as a wider leeway of action assigned to citizens.

These objectives are long-term, allow for flexibility to do justice to continuous social change and should be understood as inextricably linked to the existing targets set by different specialised strategies of the City of Vienna (Fig. 3). The framework strategy does not substitute the targets of these specialised strategies but is to act like a magnet, i.e. as a superordinate and thematic framework that is in its turn encapsulated in existing plans, strategies, catalogues of targets and works.
As a smart city, Vienna must also be resilient and hence robust, flexible, adaptive and able to react quickly and in keeping with the challenges faced with internal and external influences. In this, resilience is strongly dependent on the availability of room to manoeuvre, on the possibilities for self-organisation or for re-organisation of economic and social systems, on social coherence, on the competencies of residents and on a flexible and innovative administration.

The three major sets of goals – resource preservation, quality of life and innovation – are closely interlinked. Vienna wants to maintain its excellent position in the international competition of cities, although it is not enough to hold a top position regarding only one of these sets. Vienna maintains a close dialogue with leading cities in Europe and worldwide on promising approaches. The Viennese approach will be very special.

It is thus the key goal for 2050 of Smart City Wien to offer optimum quality of life, combined with highest possible resource preservation, for all citizens. This can be achieved through comprehensive innovations.

The present framework strategy describes the key goals and principal approaches chosen to attain them. It represents guidelines for the numerous important specialised strategies of the city that define concrete multiyear plans for such areas as urban planning, climate protection, the future of energy supply or Vienna as an innovation hub. In this, the framework strategy poses a twofold challenge: first of all, how can the goals be gradually rendered more and more ambitious despite the demanding practical and financial frame conditions? And, secondly: how can policy and change processes be designed in an even more cross-cutting, multi-sectoral manner?

A cross-cutting concept also underpins the following Smart City Wien 2050 (page 18) vision embraced by the city.
Urban Technologies / Smart Cities

Who we are

We are Future Cities Catapult. Our mission is to advance urban innovation, to grow UK companies, to make cities better.

We bring together businesses, universities and city leaders so that they can work with each other to solve the problems that cities face.

From our Urban Innovation Centre in London, we provide world-class facilities and expertise to support the development of new products and services, as well as
PROPOSAL

We propose to design an academic training project for architects and urban designers at the university level and also addressing administrative staff.

We propose to establish an exchange program between Brazilian and European cities focused on education and professional practice issues.

We propose a dialogue with exemplary European initiatives such as Catapult’s Future Cities Program (UK) and cities which recently underwent dramatically positive urban quality changes, like Tirana/Albania.
We propose to work for the communities!

Thank You
Obrigado

tomaselli@tuwien.ac.at