UNIVERSITÄT KLAGENFURT

Thematic Doctoral Programme

Information and Communications Engineering

Founding Declaration

Decision

According to this founding declaration and in accordance with § 19 paragraph 4c, part B of the statutes of the University of Klagenfurt, the Thematic Doctoral Programme "Information and Communications Engineering" will be established as from the 2023/24 academic year.[1]

Faculty members (potential supervisors)

- Univ.-Prof. Dipl.-Ing. Dr.-Ing. Christian Bettstetter
- Assoc.-Prof. Dr.-Ing. Jean Chamberlain Chedjou
- Univ.-Prof. Dipl.-Ing.Dr. Wilfried Elmenreich
- Univ.-Prof. Dipl.-Ing. Dr. Michael Hofbaur
- Univ.-Prof. Dr.-Ing. Kyandoghere Kyamakya
- Univ.-Prof. Dipl.-Ing. Dr. Bernhard Rinner
- Univ.-Prof. Dr. Ing. Andrea M. Tonello
- Univ.Prof. Dr. Stephan Michael Weiss
- Univ.-Prof. Dipl.-Ing. Dr. Hubert Zangl

In addition, the following faculty members will be potential supervisors after their habilitation:

- DDipl.-Ing. Dr. Udo Schilcher
- Asst.-Prof. Dr. Jan Steinbrener

Speaker	Deputy Speaker
Univ.-Prof. Dr. Wilfried Elmenreich M: wilfried.elmenreich@aau.at T: +43 463 2700 3649	Univ.-Prof. Dr. Hubert Zangl M: hubert.zangl@aau.at T: +43 463 2700 3562

Academic degree

Dr. techn.

Regular study duration

3 years

Language of instruction

English

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[1] See https://www.aau.at/wp-content/uploads/2015/09/Satzung-der-AAU-Teil-B.pdf.

Profile

The doctoral programme provides students with a structured methodological background complemented by subject-specific courses required in addition to selected courses that directly contribute to their research for doctoral studies. In addition, the curriculum includes a strongly research-oriented part that focuses on writing two peer-reviewed publications. Another important goal is the international orientation of the DP. This includes, on the one hand, recruiting students from a diverse, international environment and, on the other hand, actively promoting networking and international experience through the research networks of DP members. The programme further encourages interdisciplinary collaboration, knowledge sharing, and dissemination of research methods and findings to foster innovation and contribute to the advancement of these research domains.

Research areas

The "Fachbereich Informationstechnik" is organized into two institutes, i.e. the Institute of Networked and Embedded Systems, comprising four research groups, and the Institute of Smart Systems Technologies, comprising three research groups. The seven research groups, their faculty members, and their research areas are as follows:

- **Control of Networked Systems (Weiss, Steinbrener)**
  Image processing, computer simulation, geometric image processing, control engineering, robotics, signal processing, mobile robot navigation.

- **Embedded Communication Systems (Tonello)**
  Communication Theory and Systems, Signal Processing, Cyber-physical Systems

- **Mobile Systems (Bettstetter, Schilcher)**
  Mobile communications and networks, mobile robotics, self-organizing systems

- **Pervasive Computing (Rinner)**
  Pervasive Computing, Multi-Robot Systems, Self-organization, Privacy Protection

- **Sensors and Actuators (Zangl, Hofbaur)**
  Sensor and sensor systems design, simulation and optimization, sensors in robotics, proximity perception and physical interaction, self-sustained wireless sensors, condition monitoring, modular robotics

- **Smart Grids (Elmenreich)**
  Energie informatics, Renewable Energy Systems, Smart Microgrids, Self-Organizing Systems, Swarm Robotics, Real-Time Communication, Game Engineering

- **Transportation Informatics (Kyamakya, Chedjou)**
  Systems Modeling and Simulation, Advanced Deep-Learning Technologies in Transportation, Nonlinear Dynamics in Intelligent Transportation and Logistics Systems, Neurocomputing for various Data Analytics applications, Neurocomputing for Inverse Problems Solving, Physics Informed Neural Networks.

Teaching plan
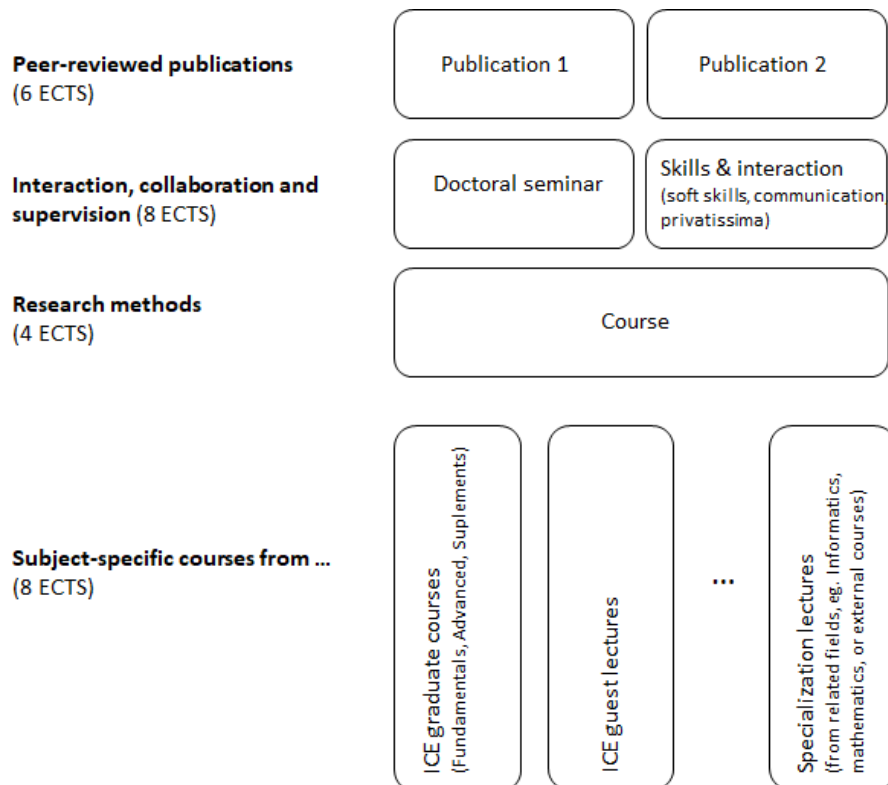
- *Subject-specific courses* offer in-depth knowledge highly relevant to the thesis topic. AAU already provides a wide variety of such graduate courses (e.g., in different specialization areas of the existing master programmes in Mathematics, Informatics, or Information and Communications Engineering). Guest lectures and lectures completed at other universities represent another pool for subject-specific courses. Overall the student has to complete at least 8 ECTS in such courses, the list is to be agreed upon with the supervisor(s). Courses completed at AAU will be listed in the section "Leistungen durch Lehrveranstaltungen" according to the Doctoral Curriculum for Technical Sciences; optional up to 4 ECTS can derive from courses that have been completed at other universities, summer schools, or MOOCs (with certificate) and will be listed in the section "Sonstige Leistungen".

- *Research methods* provide the common methodological ground that all doctoral students should become familiar with and benefit from. Courses on research methods are jointly offered (after consultation) with other doctoral programmes, in particular with the related programmes of the Faculty of Technical Sciences. AAU offers a catalogue of such courses, including design science research, experiment planning, data analysis, algorithmic game theory, and philosophy of science. (One course with 4 ECTS)

- The third teaching element addresses the training of interaction, collaboration and supervision. This part contains a mandatory doctoral seminar (4 ECTS) as a basic mechanism for interaction between students and supervisors as well as for initiating collaborations. Additionally, AAU offers many communications, leadership, and soft skills courses. Students have the opportunity to take special courses such as scientific

writing, research communications, project management, research integrity, gender and diversity, ethics in science, and intellectual property rights. (8 ECTS)

- The dissemination of own research results by scientific publications represents the fourth element. Together with their supervisors, students develop a publication plan, which typically starts with workshop papers and—as students improve their writing skills and more results become available—advance to conference and journal papers. One journal paper (4 ECTS) and one conference or journal paper (2 ECTS) as first author of at least category 2 are required.

Admission prerequisites

- Master in Communications and Information Engineering, Electrical Engineering, or related study programme at a national or international university
- Admission to the Doctoral Study of Technical Sciences at AAU
- Confirmation of supervision by a DP faculty member

Requirements for completion

- Doctoral thesis and defense (at least one of the supervisors must be a DP faculty member)
- Performance record documenting the required coursework specified above

Admission procedure

For the admission to the DP, the curriculum for doctoral studies of the University of Klagenfurt has to be considered.

Applicants are required to submit the following documents to the contact address given below:

- a statement of interest including a short topic description
- a confirmation of registration (Studienbestätigung)
- a confirmation of supervision

The DP faculty members will take the decision about admission jointly, following the principle of implied consent.

Deadlines

Entry into the ICE doctoral programme is possible at any time.

Contact

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