SCIENCE ▪ PASSION ▪ TECHNOLOGY

TU Graz
Graz University of Technology

UNIVERSITY PROGRAMME
CLEANROOM TECHNOLOGY

Graz University of Technology

Master of Engineering in Cleanroom Technology, 5 semesters, part-time

Academic Cleanroom Engineer, 4 semesters, part-time

LIFE LONG LEARNING

TU Graz
Graz University of Technology

UNIVERSITY PROGRAMME CLEANROOM TECHNOLOGY

Cleanroom Technology

Cleanroom technology is a core element in nearly all areas of industrial production and processing, as well as in many areas of the service industry and the healthcare sector. While the cleanroom market is one of the most strongly growing markets, there is currently a lack of qualified cleanroom engineers worldwide. The complex and broad area of expertise that constitutes cleanroom technology includes many engineering disciplines, however, cleanroom technology is still not a profession of its own. In addition, the complexity of the subject “cleanroom technology” is not covered by existing university programmes in Europe.


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Products that are manufactured under cleanroom conditions are subject to specific expectations in terms of their quality. The competence of personnel in charge is of key importance in the planning, installation, qualification, as well as the operation phase of a cleanroom. A lack of know-how or even a weak reasoning of the involved persons can negatively influence projects. Thus, it is indispensable to trust in experts that have a profound understanding of the highly interdisciplinary field of cleanroom technology over the entire range of services. What is in demand is not a complete and deep knowledge in all disciplines, but rather a good basic understanding of all relevant technologies.

LIFE LONG LEARNING


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Johann Kurz, former head of department in the Austrian Federal Ministry of Health

The idea for this programme emerged from my diverse professional experiences over the years that indicated that the mastery of cleanroom technology requires extensive knowledge from a wide variety of disciplines in the natural sciences and the humanities. The company Ortner supported this idea and Graz University of Technology provided the infrastructure and university know-how to develop and realize a master’s programme. This programme fills educational gaps in the areas of pharmaceuticals, tissue and blood, as well as in microelectronics, the medical devices sector and the food industry.


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Curriculum for Master of Engineering in Cleanroom Technology and Academic Cleanroom Engineer

Comprehensive knowledge is aquired in 3 modules:

- Fundamentals and Introduction
- Elements of Cleanroom Technology
- Specialisation and Practice

Fundamentals and Introduction
Introduction to the university programme
Introduction to scientific writing*
Fundamentals of microbiology
Fundamentals of hygiene
Fundamentals of chemical and process engineering
Transport phenomena
Fluid mechanics
Fundamentals of material sciences
Fundamentals of measurement instrumentation, control theory and electrical engineering
Introduction to technical documentation
Introduction to computer simulation*

Elements of Cleanroom Technology
Cleanroom Technology: construction technology
Cleanroom Technology: cleanroom components
Cleanroom Technology: cleanroom operation
Introduction to particle technology
Filtration technology
Cleanroom monitoring*
Regulations and audits
Qualification and validation
Quality by design*
Introduction to project management
Introduction to risk management
Business administration tool

Specialisation and Practice
Excursion
Central case project
Food microbiology and food technology
Computer simulation in cleanroom applications*

- The Master of Engineering in Cleanroom Technology requires the writing of a master's thesis.

* These courses are only taken in the Master of Engineering programme.


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Stefan Radl and Johannes Khinast, programme director and founding programme director

Annual investments in cleanroom components for industrial production processes are increasing steadily. This applies to almost all industries: from automotive engineering, aeronautical and aerospace engineering, to the production of pharmaceuticals and medical products, to microelectronics and modern LED lamps. The university programme provides the basis for an education that allows graduates to apply current technologies and to design and implement new developments.

General information

Target groups

The target groups represent a wide variety of areas: medical doctors, medical technicians, microelectronics engineers, chemical and process engineers, architects and civil engineers, engineers from the pharmaceutical industry, engineers from the food industry, facility planners and facility builders, government representatives

Programme options and completion

Degree: „Master of Engineering in Cleanroom Technology“
- Scope: 90 ECTS credits
- Duration: 5 semesters, part-time

Certificate: “Academic Cleanroom Engineer”
- Scope: 60 ECTS credits
- Duration: 4 semesters, part-time

Admission Requirements

You must have one of the following qualifications to be admitted to the master’s programme Master of Engineering in Cleanroom Technology (90 ECTS):

- An internationally recognized academic degree (bachelor’s, master’s or diploma degree from a university or university of applied sciences in Austria or abroad) in the field of engineering, in the natural sciences, or in economics. In case you have an economics degree, you also need two years of relevant professional experience in cleanroom technology.
- An internationally recognized degree in human medicine or veterinary medicine.

You can be admitted to the university programme Academic Cleanroom Engineer (60 ECTS) if you have successfully finished an academic secondary school or a vocational secondary school (secondary school leaving certificate) and have at least 2 years of professional experience in cleanroom technology or at least 2 years of professional experience at a research or teaching institution. The latter includes universities or universities of applied sciences.

Job description “Cleanroom Engineer”

Graduates

- have mastered the fundamentals of scientific work, law and business that provide the basis for a comprehensive understanding of the complex interrelations inherent to cleanroom technology.
- have broad professional knowledge of planning, constructing, commissioning, qualifying, and operating cleanrooms and facilities related to cleanrooms.
- are able to analyze production and work processes, to evaluate human-machine interactions, and to develop and implement sustainable solutions in the context of cleanrooms.
- are able to identify risks and dangers, and are prepared to react to them by taking appropriate measures.
- are people with an excellent understanding of quality, a good combination of judgment and evaluation skills, a profound technical understanding, and an outstanding sense of responsibility.

Career Options and Qualifications

For providing the scientific basis, for planning and bids, for research and development, as well as for facility construction and equipment manufacturing, it is imperative to possess sound knowledge that cuts across all relevant areas of expertise. Cleanroom engineers work primarily in planning and engineering companies; architecture firms; heating, ventilation and air conditioning companies; companies specializing in interior construction, electrical engineering, measurement and control, or high purity media supply; equipment manufacturing companies; consulting firms; as well as qualification companies. As a matter of course, cleanroom engineers assume responsibility for cleanrooms during the certification process and oversee their operation in a variety of sectors, for example pharmaceutical production, food processing, the semiconductor industry, aviation and space, or automobile manufacturing.

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Christine Stoeckler-Penz, director TU Graz Life Long Learning

The unique university programme in Cleanroom Technology offered by Graz University of Technology‘s Life Long Learning was developed in cooperation with industrial partners. Knowledge obtained from university research is linked to practical knowledge and conveyed by university instructors and industrial experts. The university programme in Cleanroom Technology is an important component of the continuing education programme of Life Long Learning: we are proud that Graz University of Technology has created the first university cleanroom technology programme in Europe and thank all our partners for their support.

UNIVERSITY PROGRAMME CLEANROOM TECHNOLOGY

Final degree/certification and programme length

Master of Engineering in Cleanroom Technology:
5 semesters part-time, 90 ECTS

Academic Cleanroom Engineer:
4 semesters part-time, 60 ECTS

Language of instruction

English

Location

TU Graz, Campus Inffeldgasse
and online

Tuition fee

Master of Engineering
in Cleanroom Technology: € 18,900 (VAT free)

Academic Cleanroom Engineer: € 13,900 (VAT free)

This fee does not include travel, lodging or meal expenses.

Application

End of application period: 30 June 2017

More information on registration and registration documents can be found at:

- www.cleanroomtechnology.tugraz.at

and in the Life Long Learning office (see below).

Instructors

Instructors include university professors at Graz University of Technology, as well as experts from the industry and various business sectors.

(C) Stefan Radl, Graz University of Technology

Individual counselling

Graz University of Technology

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LIFE LONG LEARNING

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process & particle engineering

Continuing education that is up-to-date with science, business and technology

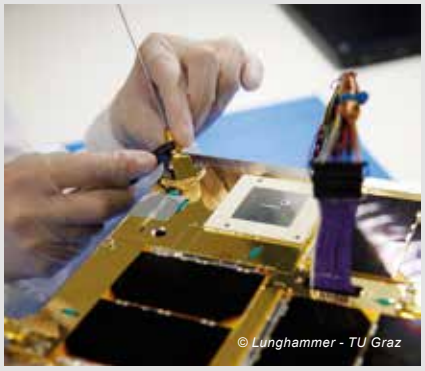
Graz University of Technology stands for the highest level of research and development. More than 13,000 students benefit from a wide range of subjects in technology and the natural sciences as well as excellent contacts in the worlds of business and industry and at other academic institutions.

With Life Long Learning, Graz University of Technology has significantly expanded its postgraduate educational offerings. These offerings are based on research and teaching in the fields of expertise of Graz University of Technology and stand out thanks to their special quality.

This programme was developed at Graz University of Technology in cooperation with well-known national and international companies. Its specific emphasis is on problems that arise in daily practice.

Institute of Process and Particle Engineering at Graz University of Technology

The Institute of Process and Particle Engineering has been active for years in teaching and research with a focus on processes in the pharmaceutical industry. Along with pharmaceutical engineering and classical particle technology disciplines, cleanroom technology is one of the main areas of research at the institute. Specifically, the main subjects of scientific investigation are hydrogen peroxide decontamination technology, the simulation of flow in cleanrooms, as well as transport of particle and molecular contaminants.
Led by Johannes Khinast, the institute tightly cooperates with industry, places an emphasis on teaching fundamentals, performs internationally-renowned research, and publishes in high-ranking international scientific journals.



Cooperation partners in developing the programme:

- ATP Architekten und Ingenieure
- Baxter Innovations GmbH
- CAS Clean-Air-Service AG
- Fresenius Kabi GmbH
- Hämosan Life Science Services GmbH
- Human.technology Styria
- Infineon Technologies Austria AG
- Kraft Foods R&D Inc.
- M+W Process Industries GmbH
- Ortner Reinraumtechnik GmbH
- PEA-CEE GmbH
- Rupp AG
- Schirnhofer AG

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