



Life Sciences and Facility Management

TRANSPARENCY

2018 edition

Facts and information about
studies – continuing education – research
and development – services

Management and organisation

School of Life Sciences and Facility Management



Photo: Frank Brüdert

School management:

Karin Altermatt, Christian Hinderling, Margrit Büeler, Rolf Krebs, Urs Hilber, Michael Kleinert, Antje Junghans, Daniel Baumann

Organisation:

- ATV Department Transversalis
Director: Karin Altermatt
- IAS Institute of Applied Simulation
Director: Prof. Marcel Burkhard (not pictured)
- ICBT Institute of Chemistry and Biotechnology
Director: Prof. Dr. Christian Hinderling
- IFM Institute of Facility Management
Director: Prof. Dr. Antje Junghans
- ILGI Institute of Food and Beverage Innovation
Director: Prof. Michael Kleinert
- IUNR Institute of Natural Resource Sciences
Director: Prof. Dr. Rolf Krebs

Senior management:

Prof. Dr. Urs Hilber, Dean of ZHAW LSFM

Margrit Büeler, Assistant to the Dean

Prof. Dr. Daniel Baumann, Head of Education, Research and Resources

Here the future has already begun!

Dear reader

With our expertise in life sciences and facility management, we make an important contribution to solving some of the challenges facing society today and to improving quality of life in the areas of environment, food and health. What we achieved in 2017 as part of our 2025 strategy is described below.

Popular new Master's programmes

In autumn 2017, the new, independent Master's programme in Environment and Natural Resources was launched for the first time with 47 participants. 2017 also saw the start of the specialisation Applied Computational Life Sciences (ACLS), which is taught in English and offered as part of the Master's programme in Life Sciences. The ZHAW is thus responding to the growing demand for specialists in the management of very large volumes of data in the life sciences. Of the 69 new Master students, 16 have chosen the ACLS specialisation.

High performance computing

The 'digital revolution' is leading to profound changes in the life sciences. Today's research projects and the very large amounts of data associated with them demand high-performance computing (HPC). For this reason, an in-house HPC cluster was set up at the school. By parallelising to multiple cores, the computing capacity can be increased significantly and the computation time can be drastically reduced. HPC is used in most of the school's specialist areas; for example, in genomics to quickly analyse genetic sequences, and in food technology to calculate the core temperature of food on refrigerated shelves on the basis of models. Competences in the use of digital tools and handling very large amounts of data are key additions to our specialist skills and accompany our researchers into the future.

Apprentices discover new types of bacteria

Two apprentices analysed soil samples as part of their training in order to learn how to determine the various species living there. In so doing, they discovered two previously unknown types of bacteria, *Pseudomonas wadenswilerensis* sp. nov. and *Pseudomonas reidholzensis* sp. nov. These discoveries were published in the internationally renowned scientific journal 'International Journal of Systematic and Evolutionary Microbiology' in 2017. The collaboration of professionals in vocational training, genetics and microbiology with the apprentices combined with our high level of infrastructure, made this success possible, and we are very proud of this achievement.

Competence Center for Biocatalysis

Biocatalysis is an emerging field of research. Many chemical reactions can be carried out in an efficient, sustainable and environmentally-friendly manner with the help of enzymes (biocatalysts). In 2017, the Swiss federal government set aside CHF 2 million to support the establishment of a centre for biocatalysis innovation under the leadership of the ZHAW in Wädenswil. The Switzerland-wide platform will be used to develop a toolbox for industrial biocatalysis, thus promoting sustainable organically-based production in Switzerland.

As you can see, the future has already begun here at the School of Life Sciences and Facility Management. We are making important contributions to solving societal challenges and to improving quality of life, both today and tomorrow.



Prof. Dr. Urs Hilber
Dean

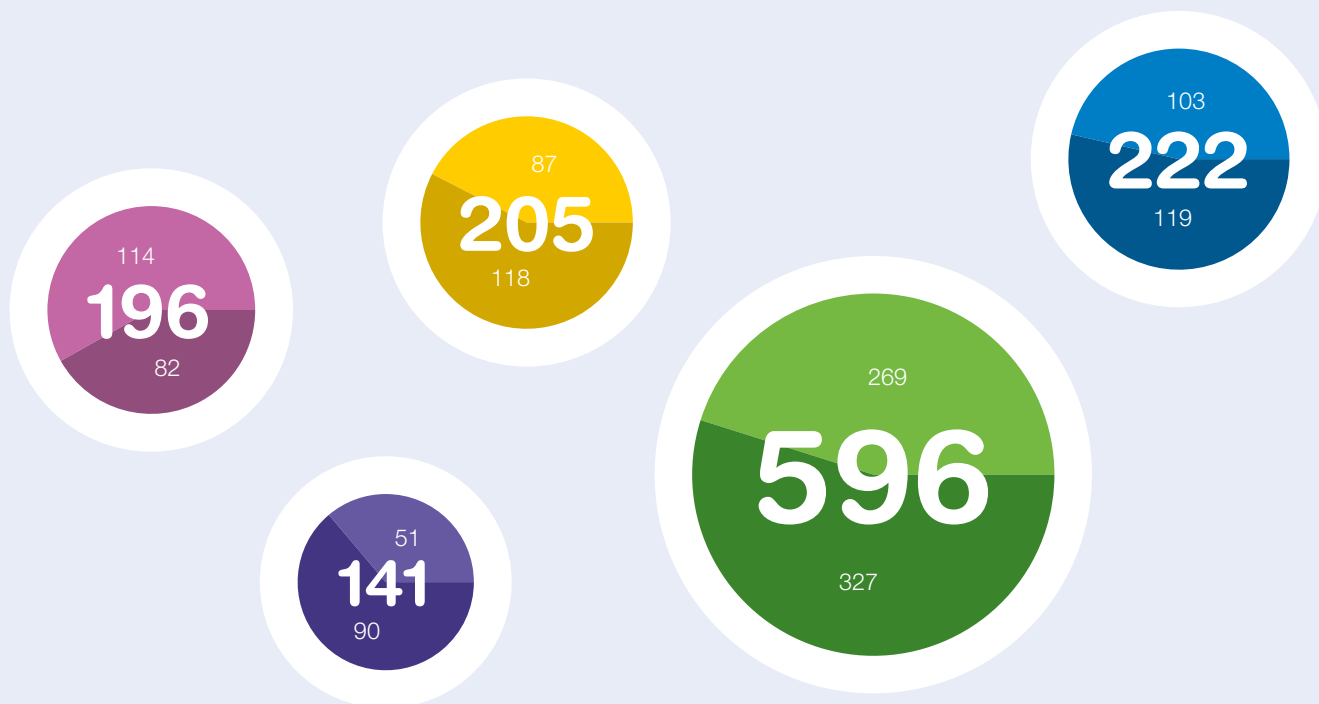


Environment | Food | Health | Society
Our competences in Life Sciences
and Facility Management.

Bachelor's degree programme

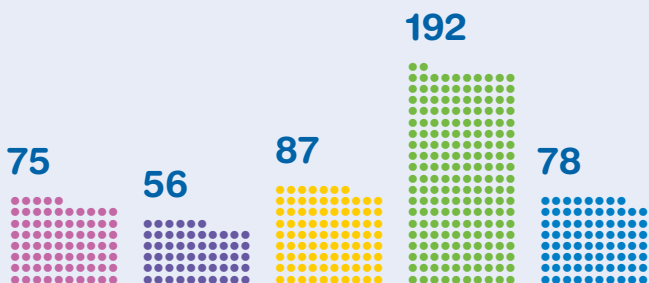
2017

1360 Students



Life Sciences and Facility Management

488 Admissions



Life Sciences and Facility Management

Graduates



Biotechnology **49**
 Chemistry **32**
 Food Technology **51**
 Natural Resource Sciences **110**
 Facility Management **62**

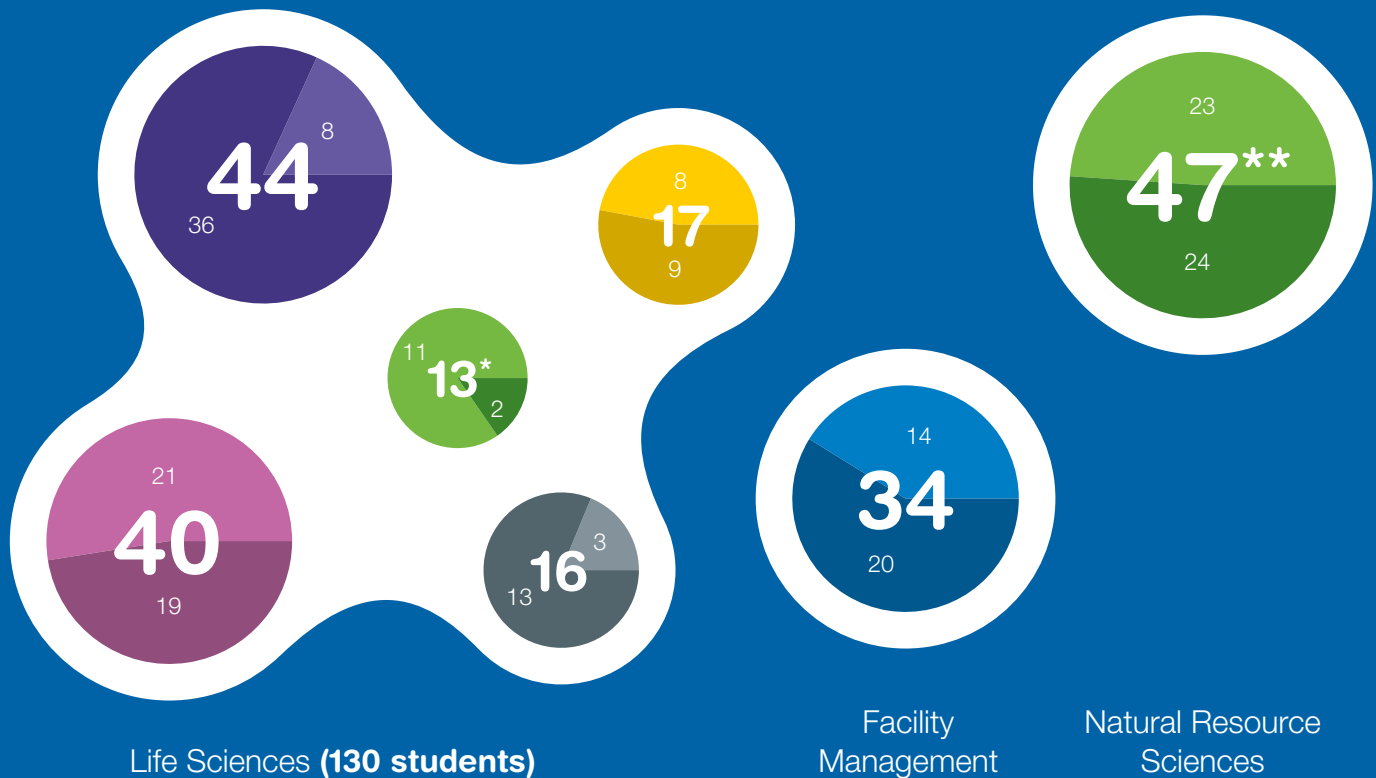
Biotechnology
 Chemistry
 Food Technology
 Natural Resource Sciences
 Facility Management

Women
 Men

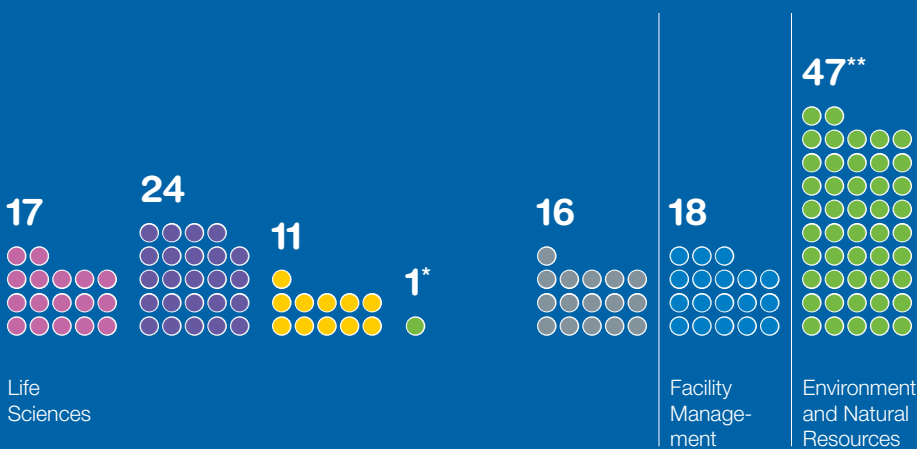
Status as of 15.10.2017 based on SBFI report
 Number of students

Master's degree programme 2017

211 Students



134 Admissions



Graduates



Master of Science ZFH in Life Sciences with specialisations in:

- Pharmaceutical Biotechnology
- Chemistry for the Life Sciences
- Food and Beverage Innovation
- Natural Resource Sciences (until 2017)
- Applied Computational Life Sciences

Master of Science ZFH in Facility Management

- Facility Management

Master of Science ZFH in Environment and Natural Resources

- Environment and Natural Resources (new from 2017)



Status as of 15.10.2017 based on SBF1 report
Number of students

Continuing education, courses and conferences

2017

Programmes

The range of continuing education programmes offered at the Wädenswil and Zurich locations include international conferences, continuing education courses (WBK), certificate and diploma courses (CAS, DAS) and postgraduate courses over several semesters (MAS). Our programmes are aimed at those who have completed a university education, are in professional life, and want to expand or deepen their expertise.

Qualifications

MAS: The Master of Advanced Studies (MAS) is the most comprehensive further education programme and comprises 60 credits. The programme is part-time, usually modular in structure, and takes place over several semesters. Consisting of a number of partial qualifications, it concludes with a Master's thesis.

DAS: The diploma course Diploma of Advanced Studies (DAS) comprises 30 credits. It provides in-depth further training in a specific professional field.

CAS: The Certificate of Advanced Studies (CAS) is an independent course with 10–15 credits, which can also form part of an MAS or DAS.

Participants
in the continuing education events

2754



MAS, DAS, CAS **315**
Continuing education courses **1097**
Symposia **1342**

Number of continuing
education events

91

Status as of 31.12.2017

chromatography system. Photo: Frank Bröderli ▶



Research and development

Competences



Test equipment for continuous filtration and quality stabilisation of deep-frying oil – an ILGI project. Photo: Frank Brüderli

The disciplinary expertise in each of our five institutes provides a solid basis for solving the problems our partners and customers face. We carry out projects and fulfil contracts with a practically-oriented and creative approach. Whether as part of a specific Bachelor's thesis or as an interdisciplinary research project over several years, we welcome the opportunity to offer you our support.

■ Research focal points at the IAS Institute of Applied Simulation

- Complex biosystems
- Predictive & bio-inspired modelling
- Computational life sciences

■ Research focal points at the ICBT Institute of Chemistry and Bio- technology

- Chemical and biotechnological processes and plants
- Chemistry and new materials
- Biochemistry, micro- and molecular biology, tissue engineering and bioanalytics
- Analytical and physical chemistry
- Pharmaceutical drug research and drug development
- Cell biology and tissue engineering

■ Research focal points at the IFM Institute of Facility Management

- Strategic facility management
- Business skills in FM
- Hospitality and service management
- Real estate management

■ Research focal points at the ILGI Institute of Food and Beverage Innovation

- Food technology and packaging
- Beverage technology and flavour research
- Food quality, safety and quality management
- Consumer behaviour and consumer diet

■ Research focal points at the IUNR Institute of Natural Resource Sciences

- Landscape and tourism
- Sustainability communications
- Urban green spaces
- Organic agriculture
- Ecological engineering
- Integrative ecology

Publications

Extracts from 2017

Scientific publications are an important element in the transfer of knowledge between research and practice. A selection of key publications from the year 2017 is given below. The complete list of all the School of Life Sciences and Facility Management's publications can be found at www.zhaw.ch/lsfm/forschung.

IAS

Glüge, S., Böck, R. and Ott, T. (2017). Emotion Recognition from Speech using Representation Learning in Extreme Learning Machines. In Proceedings of the 9th International Joint Conference on Computational Intelligence (IJCCI 2017), pages 179–185.

Bijlenga, P., Gondar, R., **Schilling, S., Morel, S., Hirsch, S., Cuony, J., Perren, F., Rüfenacht, D., Schaller, K.** (2017). PHASES Score for the Management of Intracranial Aneurysm: A Cross-Sectional Population-Based Retrospective Study. *Stroke*, 48, 8. 2105-2112.

Nater, A., Mattle-Greminger, MP., Nurcahyo, A., Nowak, MG., de Manuel, M., Desai, T., Groves, C., Pybus, M., Sonay, TB., Roos, C., Lameira, A., Wich, SA., Askew J., Davila-Ross, M., Fredriksson, G., de Valles, G., Casals, F., Prado-Martinez, J., Goossens, B., Verschoor, EJ., Warren, KS., Singleton, I., Marques, DA., Pamungkas, J., Perwitasari-Farajallah, D., Rianti, P., Tuuga, A., Gut, IG., Gut, M., Orozco Wengel, P., van Schaik, CP., Bertranpetit, J., **Anisimova, M., Scally, A., Marques-Bonet, T., Meijaard, E., Krützen, M.** (2017). Morphometric, Behavioral, and Genomic Evidence for a New Orangutan Species. *Current Biology*, 27: 3487-3498.e10.

ICBT

Senn, N., Ott, M., Lanz, O., **Riedl, R.**, (2017). Targeted Polypharmacology: Discovery of a Highly Potent Non-Hydroxamate Dual Matrix Metalloproteinase (MMP)-10/-13 Inhibitor. *Journal of Medicinal Chemistry* 2017 60 (23), 9585-9598.

Deuber, F., Mousavi, S., Federer, L., **Adlhart, C.** (2017) Amphiphilic Nanofiber Based Aerogels from Electrospun Biopolymers for Selective Liquid Absorption. *Adv. Mater. Interfaces* 2017, 4, 201700065, <https://doi.org/10.1002/admi.201700065>.

Schirmer, C., Blaszczyk, K., Husemann, U., Leupold, M., Zahnow, C., Rupprecht, J., Glöckler, R., Greller, G., Pörtner, R., **Eibl, R., Eibl, D.** (2017) Standardized qualification of stirred reactors for microbial biopharmaceutical production processes. *Chemie Ingenieur Technik* 2017, 89(12), 1766-1772.

IFM

Teles, S., Bertel, D., **Kofler, A., Ruscher, S., Paúl, C.** (2017). A Multi-perspective View on AAL Stakeholders' Needs - A User-centred Requirement Analysis for the Activeadvance European Project. In Proceedings of the 3rd International Conference on Information and Communication Technologies for Ageing Well and e-Health - Volume 1: ICT4AWE. Pages 104-116. <https://doi.org/10.5220/0006380701040116>.

Konkol, J., **Schanné, F., Lange, S., Degenhardt, B., Weichbrodt, J., Gisin, L., Schweingruber, D., Coradi, A., Kleibrink, M., Metzger-Pegau, L., Windlinger, L.** (2017). Gesundheitsförderliche Büroräume und Workplace Change Management – ein Leitfaden. Bern und Lausanne: Gesundheitsförderung Schweiz.

Asworth, S., Druhmman, C. (2017) Integration of FM expertise and end user needs in the BIM process using the Employer's Information Requirements (EIR), World Building Congress 2016.

ILGI

Born, Y., **Fieseler, L.,** Thöny, V., Leimer, N., Duffy, B., Loessner, M. (2017) Engineering of bacteriophages Y2::dpoL1-C and Y2::luxAB for efficient control and rapid detection of the fire blight pathogen, *Erwinia amylovora*. *Applied and Environmental Microbiology*, 83, 12. e00341-17.

Yildirim, S., Röcker, B. (2017) Active packaging applications for food. *Comprehensive Reviews in Food Sciences and Food Safety*. 17(1), S. 165–199. <https://doi.org/10.1111/1541-4337.12322>.

Brombach, C. (2017) Meals and eating practices within a multi-generational approach: a qualitative insight study. *International Journal of Clinical Nutrition & Dietetics*. 3(122), S. 1–6. <https://doi.org/10.21256/zhaw-4120>.

IUNR

Itten, R., Stucki, M. (2017). Highly efficient 3rd generation multi-junction solar cells using silicon heterojunction and perovskite tandem: prospective life cycle environmental impacts. *Energies*. 10(7), S. 1–18. <https://doi.org/10.21256/zhaw-1314>.

Robin, K., **Graf, R., Schnidrig, R.** (2017). Wildtiermanagement – Eine Einführung. Haupt, Bern, 335 S.

Schmautz, Z., Graber, A., Jaenicke, S., Goesmann, A., Junge, R., Smits, T. (2017). Microbial diversity in different compartments of an aquaponics system. *Archives of Microbiology*. 199(4), S. 613-620. <https://doi.org/10.21256/zhaw-1593>.

Finances

2017



Experimental plant with Miscanthus, Photo: Frank Bröderli

At the end of 2017, the headline 'This was the year of records' appeared on the website finanzen.ch. The DAX exceeded 13,000 points, the Dow Jones passed 24,000, and the crypto currency Bitcoin drew attention to blockchain technology, into which more and more investor funds were flowing. But how did our school develop in terms of numbers in 2017?

More Master's students

The number of enrolled undergraduate students remained at an almost constant high level compared to the previous year, while the number of Master's students increased slightly from 196 in 2016 to 211 in 2017. In continuing education, which also includes conferences, the previous year's trend continued: the number of participants fell sharply, with a drop of around 1000 participants, although revenues were slightly higher than in the previous year. In this area, the range of products and services on offer are being streamlined, and efficiency and effectiveness are increasing.

Growth in research

Research and development (R&D) continued to develop positively. Our researchers generated CHF 18.3 million, which is CHF 300,000 more than in the previous year. At around CHF 2.5 million, service revenues were slightly below the previous year's level (CHF 2.8 million).

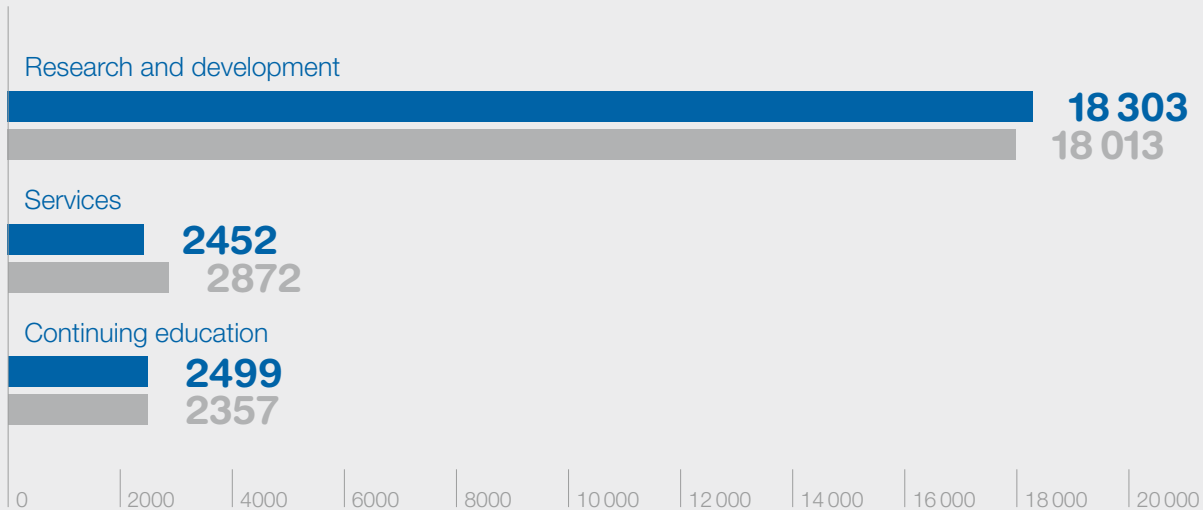
Largest employer

The ZHAW continues to be the largest employer in Wädenswil and is of great importance for the Zurich Parkside region. With 597 employees (457 full-time positions), we are slightly below the previous year (605 employees, 462 full-time positions). The gender distribution is again very balanced (306 women and 291 men). The high proportion of part-time employees (men and women) is a further positive factor, distinguishing the ZHAW as a particularly family-friendly employer.

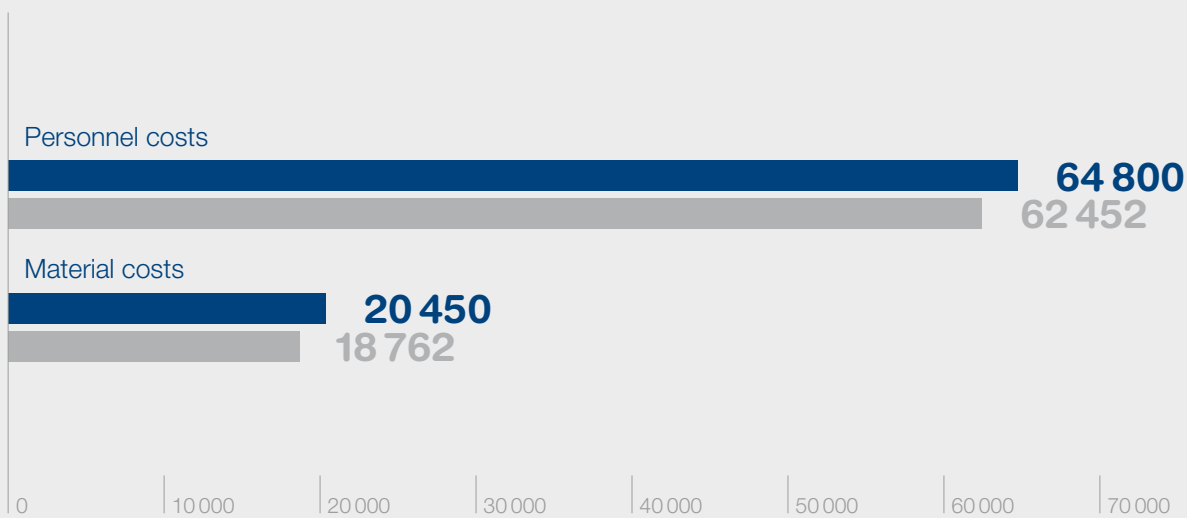
Stable situation

The economic and financial situation at the School of Life Sciences and Facility Management (LSFM) was stable in 2017. We are approaching the future in a practically-oriented, creative, passionate and reflective way, and are delighted to be able to make an important contribution to Switzerland's further development with education and research. We value the trust that we receive from private companies, public institutions and our sponsoring canton enormously, and are highly motivated by it.

Revenue from the performance areas of research and development, services and continuing education



Costs for all performance areas (studies, research and development, services, continuing education)



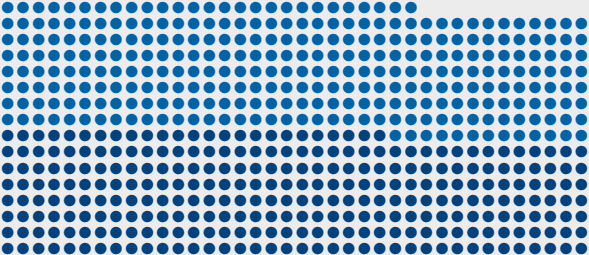
■ 2017
■ 2016

Revenue not including contributions from the Canton of Zurich.
All amounts are given in 1000 CHF.

Employees

School of LSFM

Personnel



♀ 306 · ♂ 291

597

Full-time equivalents

457

Employees by organisational unit

36
IAS

168
ICBT

50
IFM

76
ILGI

192
IUNR

28
AWG/ATV

47
Management/
Strategic Affairs
Unit

Employees by category

160
Professors and
lecturers

195
Research associates

130
Assistants

105
Administration,
technology and
operations personnel

7
Apprentices

Status as of 31.12.2017

Foundations and boards

Foundations

The School of Life Sciences and Facility Management (LSFM) supports various foundations, primarily technically and with human resources, and thanks to this commitment, also benefits financially. The LSFM is represented in the following foundations:

Stiftung Technische Obstverwertung, Wädenswil

- Prof. Dr. Urs Hilber, Dean of ZHAW LSFM

Stiftung Gartenbau, Wädenswil

- Prof. Dr. Rolf Krebs, Director of the Institute of Natural Resource Sciences, ZHAW

grow, Wädenswil start-up organisation

- Prof. Dr. Urs Hilber, Dean of ZHAW LSFM (on the Board of Trustees)
- Catherine Kroll, Director of the Technology Transfer Office, ZHAW LSFM (in the senior management)

Alumni organisations

Representatives of the School of Life Sciences and Facility Management:

Alumni ZHAW Facility Management

- Prof. Dr. Antje Junghans, Director of the Institute of Facility Management, ZHAW (member)
- Simon Ashworth, Research Associate, Institute of Facility Management, ZHAW (member of the board)

Alumni ZHAW Life Sciences

- Prof. Dr. Daniel Baumann, Head of Education, Research and Resources, ZHAW LSFM (member of the board)

Alumni Network Wädenswil

- Prof. Dr. Daniel Baumann, Head of Education, Research and Resources, ZHAW LSFM (member of the board)

Advisory boards

To ensure the practical relevance and quality of education and applied research, as well as to secure long-term development, numerous representatives of business and professional organisations support our institutes in an advisory capacity.

Advisory board of the Institute of Chemistry and Biotechnology

- Prof. Dieter Beckmann, Institute for Bio-processing and Analytical Measurement Techniques
- Dr. Gunter Festel, Owner of FESTEL CAPITAL
- Prof. Dr. Christian Hinderling, Director of the ZHAW Institute of Chemistry and Biotechnology
- Dr. Erich Hochuli, formerly of F. Hoffmann-La Roche Ltd.
- Dr. Jan Lucht, scienceindustries, Business Association Chemistry Pharma Biotech
- Dr. Ferruccio Messi, Cell Culture Technologies LLC
- Hans-Peter Meyer, HES-SO University of Applied Sciences Western Switzerland
- Dr. Thomas Münch, Givaudan Schweiz AG
- Dr. Martin Riediker, expert at CTI (Commission for Technology and Innovation), now called: Innosuisse – Swiss Innovation Agency
- Dr. Philippe Steiert, CSEM, Swiss Center for Electronics and Microtechnology
- Markus Tanner, Werthenstein Biopharma GmbH
- Dr. Pius Waldmeier, Head of Synthesis & Process Research Group, F. Hoffmann-La Roche Ltd.
- Dr. Roland Wohlgemuth, Sigma-Aldrich Chemie GmbH

Advisory board of the Institute of Facility Management

- Ricarda Berg, CEO, TREOS Facility Management AG
- Michael Bürki, Head of IMS Clean, Post Real Estate Management and Services Ltd
- Astrid Furrer, Cantonal and City Councillor FDP, Co-President of the Social Conference of the Canton of Zurich
- Renate Gröger, Director of Operations, University Hospital Zurich

- Prof. Dr. Tore Haugen, Centre for Real Estate and Facility Management, Norwegian University of Science and Technology (NTNU)
- Prof. Dr. Antje Junghans, Director of the ZHAW Institute of Facility Management
- Wolfgang Stiebellehner, Head of Property Management, Livit AG
- Dr. Jürg Werner, CEO Metall Zug AG
- Daniel Zbinden, Head of Energy Contracting, EKZ

Advisory board of the Institute of Food and Beverage Innovation

- Dr. Michael Beer, Vice Director, Head of Food and Nutrition, Federal Office of Public Health
- Dr. Thomas Büeler, Head of Innovation and Process Intelligence, Emmi Management AG
- Dr. Karl W. Gschwend, Managing Director Operations, Hochdorf Swiss Nutrition AG
- Prof. Michael Kleinert, Director of the ZHAW Institute of Food and Beverage Innovation
- Cédric Ochsner, Member of the Executive Board, Midor AG
- Andreas Schwab, Head of Production, Le Patron Orior Menu AG
- Prof. Dr. Erich Windhab, Professor of Food Process Engineering, ETH Zürich

Advisory board of the Institute of Natural Resource Sciences

- Prof. Jean-Bernard Bächtiger, former Director of the ZHAW Institute of Natural Resource Sciences
- Ursin Ginsig, Manager of Eberhard Recycling AG
- Christian Guggisberg, Managing Director, Gastro Star AG
- Karin Hindenlang, Managing Director, Wildnispark Zürich
- Prof. Dr. Rolf Krebs, Director of the ZHAW Institute of Natural Resource Sciences
- Dr. Tove Larsen, Member of the Board of Directors, EAWAG
- Dr. Dr. h.c. Raimund Rodewald, Managing Director, Swiss Foundation for Landscape Conservation
- Dr. Matthias Stolze, Member of the Executive Board, Research Institute of Organic Agriculture (FiBL)

The ZHAW in Wädenswil

The ZHAW at a glance

Eight specialist schools are united under the umbrella of the Zurich University of Applied Sciences (ZHAW). With more than 12,000 students in 28 Bachelor's and 18 Master's study programmes in addition to over 7000 participants in continuing education annually, the ZHAW is one of the leading universities of applied sciences in Switzerland. All of our locations – in Wädenswil, Winterthur and Zurich – lie within the economically strong Greater Zurich Area. They offer a high quality of life for both study and work, and are easily accessible by public transport. See www.zhaw.ch

Attractive campus facilities and locations

The Grüental and Reidbach campuses in Wädenswil, which include the RA building on the Seestrasse, are situated in a beautiful location on the left bank of Lake Zurich. The teaching and working areas, laboratories and pilot plants are equipped with the latest technology, while the green spaces around the Grüental campus not only serve as learning and research sites, but also inspire the public with their extensive collection of plants. The continuing education courses of the Institute of Facility Management take place at a central location in Zurich. The research group 'Tourism and Sustainable Development' is right at the forefront at the Center da Capricorns in Wergenstein, Graubünden.

Local and regional roots

Wädenswil has established itself as an educational and research town, and actively supports the ZHAW. The ZHAW's regional science and industry networking is also reflected in its long-term close cooperation with the University of Zurich, ETH Zurich, and Zurich Parkside, the regional development organisation, as well as with Agroscope.

International orientation

ZHAW students have the opportunity to spend a semester abroad to prepare themselves for international competition in their future careers. In addition, many of the institutes' research projects and specialist conferences at the LSFM, as well as their Summer and Winter Schools, are internationally-orientated. The specialised foci of these events bring scientists and students from around the world to Wädenswil.

Promotion of entrepreneurship

Together with other initiators, the ZHAW is actively involved in the Wädenswil start-up organisation grow. With its consulting, inexpensive premises and proximity to the university, grow facilitates the step into self-employment, enables students to become entrepreneurs, and helps turn ideas into products. grow currently includes 21 organisations with 78 members. With the programme entrepreneurship@zhaw, the university also provides a start-up and counselling centre for employees interested in founding their own company.



1



2



3



4



1 Campus Grüental, Wädenswil
2 Campus Reidbach, Wädenswil
3 RA building, Wädenswil
4 Center da Capricorns, Wergenstein/GR

Studying and researching in Wädenswil: practically-oriented, creative, passionate and reflective

The ZHAW is one of the leading Swiss universities of applied sciences. The School of Life Sciences and Facility Management currently has around 1500 students and employs more than 600 people. The educational programme comprises five Bachelor's and three Master's degree programmes as well as a broad range of further training and education courses.

With our expertise in life sciences and facility management, we make an important contribution to meeting social challenges and to improving quality of life in the areas of environment, food and health. Five research-strong institutes in the fields of chemistry and biotechnology, food and beverage innovation, natural resource sciences, applied simulation and facility management make this contribution in the form of research, development and services

ZHAW Campus Reidbach / Einsiedlerstrasse

ZHAW Campus Reidbach / Seestrasse

ZHAW Campus Grüental



Environment | Food | Health | Society
Our competences in Life Sciences
and Facility Management.

Contact details

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Pay us a visit!



bilden und forschen
wädenswil