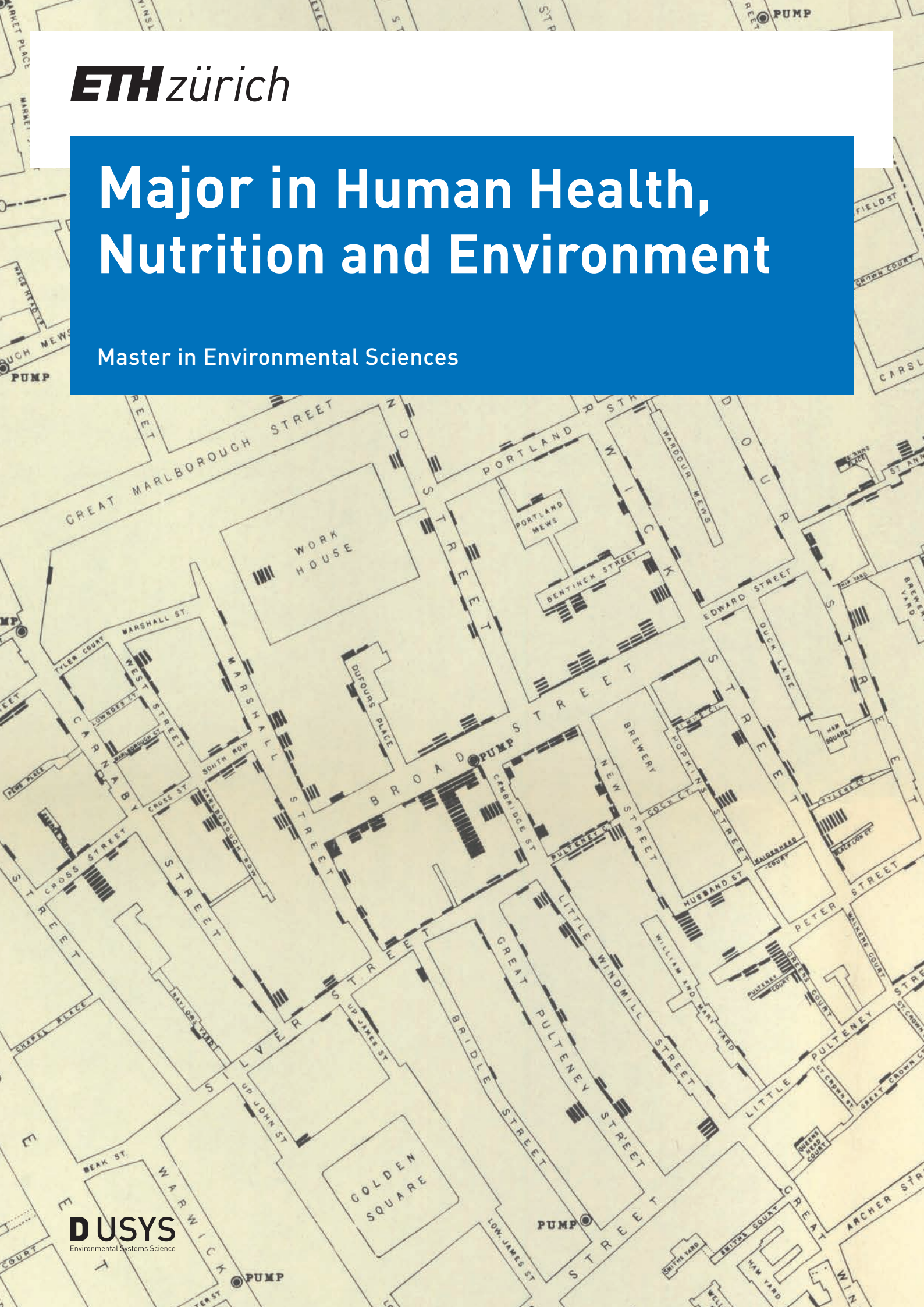
ETH zürich

Major in Human Health, Nutrition and Environment

Master in Environmental Sciences



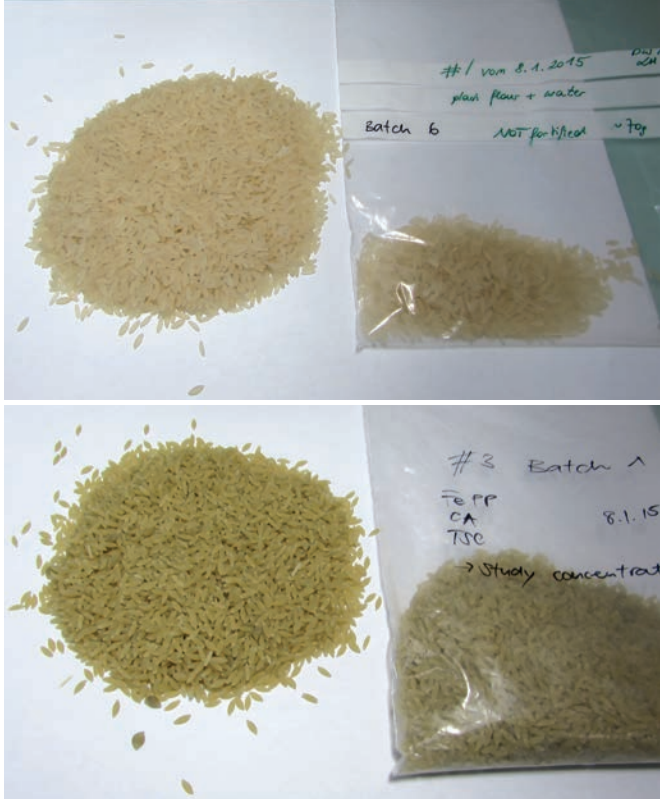
D USYS
Environmental Systems Science

Major in Human Health, Nutrition and Environment

This major is an ideal choice for trained environmental scientists who would like to apply their expertise to human health. In addition to our physical condition, our health is determined by extrinsic factors, such as the food we eat, the water we drink, and the air we breathe. Pollutants or microbes taken up from the biotic or abiotic environment can cause illness in otherwise healthy individuals. Without understanding health in its environmental context we will not be able to solve some of the most pressing public health problems we face today – for example, obesity, the antibiotic resistance crisis, or the threat posed by newly emerging infectious diseases.

The Major in Human Health, Nutrition and Environment focuses on the effects of diet, pollutants and infectious diseases on human health. It combines training in epidemiology, public health and biomedical foundations with relevant areas of food and environmental sciences as well as ecology. The molecular biology that dominates biomedical subjects is integrated with quantitative and population biological approaches. For this reason, a broad basic education in mathematics and natural sciences is required. This major will prepare students for a career in the public sector, in industry or in academia.

The major involves three institutes at two departments: the Institute of Food, Nutrition and Health at the Department of Health Sciences and Technology, the Institute of Biogeochemistry and Pollutants Dynamics, and the Institute of Integrative Biology – both at the Department of Environmental Systems Science. These institutes are leading in their respective research areas nationally and internationally.

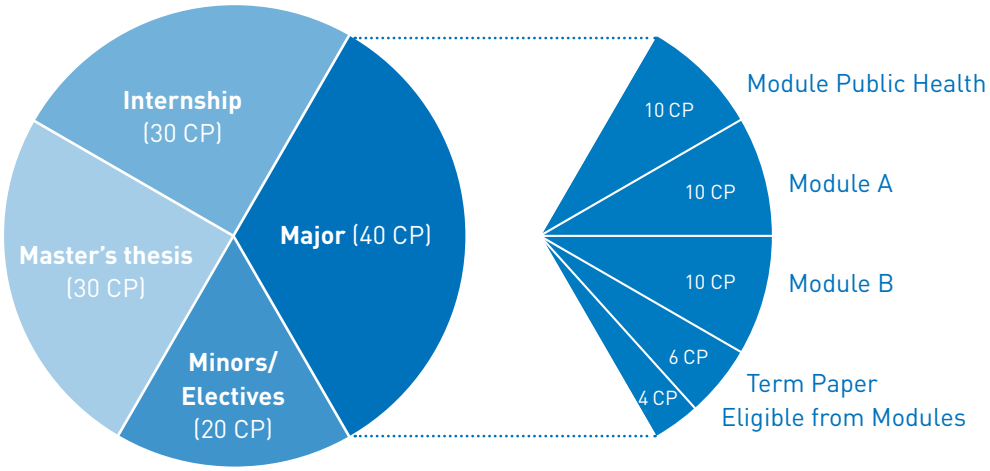


→ Researchers at the ETH Zurich have been developing iron-fortified rice to combat iron deficiency in developing countries. Above: Non-fortified rice (control) – below: Extruded iron-fortified rice.

Structure and Content

The major in Human Health, Nutrition and Environment is organised as 120 credit points (CP), of which 40 are devoted to the core of the major, 30 are for an internship, and 30 for the Master›s thesis. The Environmental Sciences curriculum also allows students to choose 20 CP of elective courses and/or (a) minor(s).

The core of Major in Human Health, Nutrition and Environment covers four subject areas in a modular structure. The Public Health Module and the Term Paper are compulsory. From the remaining three modules the students pick two:



→ Cover: On his famous map published 1855, John Snow designated the location of water pumps in Soho as well as the place of residence of cholera cases during an outbreak in 1854 – denoted by black rectangles. He could thus show that cholera is caused by contaminated water and could identify the pump – in the middle of the map – that supplied infected water.

Public health (at least 10 CP):
This obligatory module includes all aspects of public health, such as epidemiology, statistical concepts, and the development, assessment and planning of public health interventions.

Nutrition and health (at least 10 CP if chosen):
This module is primarily designed to describe and discuss the impact of diet and life style on obesity and chronic diseases in the industrialised world. But it also includes the negative health consequences of insufficient food and micronutrient deficiencies in the developing world. The module promotes food-based strategies to maintain health and to prevent disease and relies on a broad spectrum of disciplines from nutri-genomics through nutrition to consumer behaviour with a special emphasis on the physiology of eating.

Environment and health (at least 10 CP if chosen):
This module focuses on chemical and microbial pollutants and their impact on the environment and human health. It particularly deals with pollutants in water. The module provides an understanding of the biochemical, cellular and ecological aspects of toxicology and introduces chemical and biological methods to determine toxicity

Infectious diseases (at least 10 CP if chosen):
Infectious diseases are still among the major causes of death world-wide. To understand and eventually control the spread of these diseases we need to consider the demography, agricultural and ecological factors in addition to microbiology and immunology. In this module, we account for this complexity and introduce students to a discipline that has been recently called "One Health" (see, for example, http://www.cdc.gov/onehealth/).

→ Free grazing ducks in Zhejiang province, China, are potential carriers of avian influenza H5N1.

Term Paper (6 CP)
Mentored by a senior scientist, students engage with a topic of their choice for one semester, and produce a review-type paper and give an oral presentation.

In addition to these core elements, the major gives students the opportunity to collect further academic, work, and research experience:

Electives and/or Minor(s) (20 CP)
Students can broaden and deepen their training by enrolling in courses across all departments at the ETH Zurich and the University of Zurich.

Internship (30 CP)
Students gain practical experience while embedded in a governmental agency, a consultancy, conservation or health organization, or other professional environment outside of academia.

Master's thesis (30 CP)
The Master's thesis is an opportunity for students to apply their scientific knowledge to a six month research project in food science, pollutant dynamics, or infectious disease research.

→ Research groups at the ETH Zurich investigate how to provide clean drinking water without any chemical or microbial pollutants – here the reservoir Lyren in Zurich.

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