# Learning Agreement MSc HST

## Major: Medical Technology (MT)

| | |
|---|---|
| Matr. no. & student's name: | |
| Tutor's name: | |
| Start of study program: | |

### Major Profile 'Medical Technology'

Students with a Master's focus in Medical Technology will participate in a programme that exposes them to interdisciplinary research and development and trains them to contribute to human health and healthcare. Our goal is to prepare students for project leadership roles requiring the integration of engineering and life science disciplines to address urgent societal challenges in human health.
The Medical Technology Master's program focuses on the interface of technology with biology and human health, providing students with broad and complementary knowledge of biomaterials, biomechanics, biomedical devices, biomedical imaging, medical instrumentation, rehabilitation technology, and tissue engineering.
Our specific aim is to enable students to pursue a diverse range of careers in the fields of human health technology and health care. This includes research and development of biomedical devices, and more generally the translation of scientific research to clinical application. The programme is designed to enable our graduates to become leaders that are able to understand, innovate, and bring to market enabling technologies that improve human health and health care, while allowing them to recognize the social, economic, and ethical implications of their work.
The curriculum also provides a strong foundation for our students that will enter graduate research programs in medical technology, biomedical engineering, or basic sciences, as well as graduate studies in health care policy, or business.

### Compulsory Courses of the Major

| | | | | CP | | semester | exam |
|---|---|---|---|---|---|---|---|
| x | 376-0300-00 | Translational Science for Health and Medicine | Goldhahn | 3 | 2G | AS ……. | wSE |
| x | 376-0302-01 | GCP Basic Course (Modules 1 and 2)<br>(or TRREE combination 1/2.1/3.1/3.2/CH-Supplement) | Senti | 1 | 1G | A/S ……. | uSP |
| x | 376-0302-00 | Practicing Translational Science<br>(Req.: Translational Science …) | Goldhahn | 2 | 4A | SS ……. | gSP |
| **Total Core Courses** | | | | **6** | | | |

**Glossary:**

V = lecture
G = lecture with exercise
U = exercise
S = seminar
K = colloquium
P = practical/laboratory course
A = independent project
D = diploma thesis

AS = autumn semester
SS = spring semester
A/S = autumn or spring semester

wSE / oSE = written / oral Session Examination
wEE / oEE = written / oral End-of-semester Examination
gSP / uSP = graded / ungraded Semester Performance

## Elective Courses of the Major

**Elective courses that are counted for the Bachelor diploma (please tick column BSc) cannot count for the Master diploma, too.**

| | | | | CP | | sem. | exam | BSc |
|---|---|---|---|---|---|---|---|---|
| □ | 151-0604-00 | Microrobotics | Nelson | 4 | 3G | AS ….. | wEE | □ |
| □ | 227-0385-10 | Biomedical Imaging | Kozerke | 6 | 5G | AS ….. | wSE | □ |
| □ | 227-0386-00 | Biomedical Engineering | Vörös | 4 | 3G | AS ….. | wSE | □ |
| □ | 227-0393-10 | Bioelectronics and Biosensors | Vörös | 6 | 4VU | AS ….. | wSE | □ |
| □ | 227-0447-00 | Image Analysis and Computer Vision | Konukoglu | 6 | 4VU | AS ….. | wSE | □ |
| □ | 227-0939-00 | Cell Biophysics | Zambelli | 6 | 4G | AS ….. | wSE | □ |
| □ | 227-0965-00 | Micro- and Nano-Tomography of Biol. Tissues | Stampanoni | 4 | 3G | AS ….. | oSE | □ |
| □ | 227-0969-00 | Methods & Models for fMRI Data Analysis | Stephan | 6 | 4V | AS ….. | oEE | □ |
| □ | 327-0505-00 | Surfaces, Interfaces and their Applications I | Isa | 3 | 3VU | AS ….. | wEE | □ |
| □ | 363-0790-00 | Technology Entrepreneurship | Hacklin | 2 | 2V | AS ….. | gSP | □ |
| □ | 363-1163-00 | Developing Digital Biomarkers | Da Conceição | 3 | 2V | AS ….. | gSP | □ |
| □ | 376-0021-00 | Materials and Mechanics in Medicine | Zenobi-Wong | 4 | 3G | AS ….. | wSE | □ |
| □ | 376-0121-00 | Multiscale Bone Biomechanics | R. Müller | 6 | 4S | AS ….. | gSP | □ |
| □ | 376-0208-00 | Molecular and Cellular Biology of Exercise and Muscle Regeneration - Practical Aspects | Bar-Nur / De Bock | 3 | 2G | AS ….. | gSP | □ |
| □ | 376-1103-00 | Frontiers in Nanotechnology | Vogel | 4 | 4V | AS ….. | gSP | □ |
| □ | 376-1176-00 | Wearable and Mobile Technologies of the Future - Focus on Sports and Health | Menon | 4 | 3G | AS ….. | wEE | □ |
| □ | 376-1177-00 | Human Factors I | Menozzi | 3 | 2V | AS ….. | wSE | □ |
| □ | 376-1179-00 | Applications of Cybernetics in Ergonomics | Menozzi | 1 | 1U | AS ….. | gSP | □ |
| □ | 376-1219-00 | Rehabilitation Engineering II: Rehabilitation of Sensory and Vegetative Functions | Riener | 3 | 2V | AS ….. | wSE | □ |
| □ | 376-1351-00 | Micro/Nanotechnology and Microfluidics for Biomedical Applications | Delamarche | 2 | 2V | AS ….. | gSP | □ |
| □ | 376-1353-00 | Nanostructured Materials Safety | Wick | 2 | 1V | AS ….. | wEE | □ |
| □ | 376-1504-00 | Physical Human Robot Interaction (pHRI) | Lambercy | 4 | 4VU | AS ….. | oSE | □ |
| □ | 376-1622-00 | Practical Methods in Tissue Engineering (either this course or Practical Methods in Biofabrication) | Zenobi-Wong | 5 | 4P | AS ….. | gSP | □ |
| □ | 376-1651-00 | Clinical and Movement Biomechanics | Singh | 4 | 3G | AS ….. | oSE | □ |
| □ | 376-1661-00 | Ethics of Life Sciences and Biotechnology | Blasimme | 3 | 2V | AS ….. | gSP | □ |
| □ | 376-1714-00 | Biocompatible Materials | Maniura | 4 | 3V | AS ….. | wSE | □ |
| □ | 376-1985-00 | Trauma Biomechanics | Schmitt | 4 | 3VU | AS ….. | gSP | □ |
| □ | 401-0629-00 | Applied Biostatistics | Tanadini | 4 | 3G | AS ….. | oSE | □ |
| □ | 402-0674-00 | Physics in Medical Research: From Atoms to Cells | B. Müller | 6 | 3VU | AS ….. | oSE | □ |
| □ | 529-0041-00 | Moderne Massenspektroskopie, gekoppelte Analysenmethoden, Chemometrie | Zenobi | 6 | 3G | AS ….. | woSE | □ |
| □ | 535-0423-00 | Drug Delivery and Drug Targeting | Leroux | 2 | 2V | AS ….. | gSP | □ |
| □ | 551-0317-00 | Immunology I | Kopf | 3 | 2V | AS ….. | wSE | □ |
| □ | 551-0319-00 | Cellular Biochemistry (Part I) | Kutay | 3 | 2V | AS ….. | wSE | □ |
| □ | 636-0108-00 | Biological Engineering and Biotechnology | Fussenegger | 4 | 3V | AS ….. | wSE | □ |
| □ | 752-3105-00 | Physiol. Guided Food Struct. and Process Design | Fischer | 3 | 2V | AS ….. | gSP | □ |
| | | | | | | | | |
| □ | 327-2125-00 | Microscopy Training SEM I – Introduction to SEM | Zeng | 2 | 3P | A/S ….. | uSP | □ |
| □ | 327-2126-00 | Microscopy Training TEM I – Introduction to TEM | Zeng | 2 | 3P | A/S ….. | uSP | □ |
| □ | 376-0816-00 | Applied Human Research Project Management | Lustenberger | 4 | 3G | A/S ….. | uSP | □ |
| □ | 376-1974-00 | Colloquium in Biomechanics | Helgason | 2 | 2K | A/S ….. | uSP | □ |
| □ | w/o no. | Writing your Master's Thesis: Natural Sciences and Engineering C1-C2 | Diverse | 2 | 2V | A/S ….. | gSP | □ |

| | | | | CP | | sem. | exam | BSc |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| □ | 151-0630-00 | Nanorobotics | Pané Vidal | 4 | 3VU | SS ….. | wSE | □ |
| □ | 151-0638-00 | MaP Dist. Lecture Series on Engineering with Living Materials | Katzschmann | 1 | 2S | SS ….. | uSP | □ |
| □ | 151-0980-00 | Biofluiddynamics | Obrist | 4 | 3VU | SS ….. | wSE | □ |
| □ | 227-0391-00 | Medical Image Analysis | Konukoglu | 3 | 2G | SS ….. | wSE | □ |
| □ | 227-0946-00 | Molecular Imaging - Basic Principles and Biomedical Applications | Razansky | 3 | 3VA | SS ….. | wSE | □ |
| □ | 227-0948-00 | Magnetic Resonance Imaging in Medicine | Kozerke | 4 | 3G | SS ….. | oSE | □ |
| □ | 252-0312-00 | Mobile Health and Activity Monitoring | Holz | 6 | 5VA | SS ….. | wEE | □ |
| □ | 327-2224-00 | MaP Dist. Lect. Ser. on Additive Manufacturing | Katzschmann | 1 | 2S | SS ….. | uSP | □ |
| □ | 363-1130-00 | Digital Health in Practice (university of Zurich) | Uni-Doz. | 4 | 2V | SS ….. | gSP | □ |
| □ | 376-0022-00 | Imaging and Computing in Medicine | R. Müller | 6 | 4G | SS ….. | wSE | □ |
| □ | 376-0131-00 | Praktikum Biomechanik | Schütz | 3 | 3P | SS ….. | uSP | □ |
| □ | 376-0210-00 | Biomechatronics | Riener | 4 | 3G | SS ….. | wSE | □ |
| □ | 376-1150-00 | Clinical Challenges in Musculoskeletal Disorders | Leunig | 2 | 2G | SS ….. | gSP | □ |
| □ | 376-1178-00 | Human Factors II | Menozzi | 3 | 2V | SS ….. | wSE | □ |
| □ | 376-1217-00 | Rehabilitation Engineering I: Motor Functions | Riener | 4 | 3VU | SS ….. | wSE | □ |
| □ | 376-1308-00 | Development Strategies for Medical Implants | Mayer | 3 | 3VU | SS ….. | oSE | □ |
| □ | 376-1347-00 | Bioinformatic Approaches to Regulatory Genomics and Epigenomics | Germain | 4 | 4GA | SS ….. | gSP | □ |
| □ | 376-1354-00 | Nanomaterials for Health | Wick | 4 | 2G | SS ….. | gSP | □ |
| □ | 376-1392-00 | Mechanobiology: Implications for Development, Regeneration and Tissue Engineering | Shivashankar | 4 | 2G | SS ….. | wEE | □ |
| □ | 376-1397-00 | Orthopaedic Biomechanics | R. Müller | 3 | 2G | SS ….. | oSE | □ |
| □ | 376-1400-00 | Transfer of Technologies into Neurorehabilitation | Bruno | 3 | 2V | SS ….. | wSE | □ |
| □ | 376-1614-00 | Principles in Tissue Engineering | Maniura | 3 | 2V | SS ….. | gSP | □ |
| □ | 376-1620-00 | Skeletal Repair | Grad | 3 | 3G | SS ….. | gSP | □ |
| □ | 376-1624-00 | Practical Methods in Biofabrication (either this course or Practical Methods in Tissue Engineering) | Zenobi-Wong | 5 | 4P | SS ….. | gSP | □ |
| □ | 376-1660-00 | Scientific Writing, Reporting and Communication | Taylor | 3 | 2V | SS ….. | gSP | □ |
| □ | 376-1712-00 | Finite Element Analysis in Biomedical Engineering | Ferguson | 3 | 2V | SS ….. | wSE | □ |
| □ | 376-1721-00 | Bone Biology and Consequences for Human Health | Kuhn | 2 | 2V | SS ….. | gSP | □ |
| □ | 376-1986-00 | Bayesian Data Analysis on Models of Behavior (University of Zurich) | Polania | 3 | 2S | SS ….. | gSP | □ |
| □ | 402-0673-00 | Physics in Med. Research: From Humans to Cells | B. Müller | 6 | 3VU | SS ….. | oSE | □ |
| □ | 529-0059-00 | Nanoscale Molecular Imaging | Kumar | 3 | 2G | SS ….. | oSE | □ |
| □ | 551-0318-00 | Immunology II (Req.: Immunology I) | Oxenius | 3 | 2V | SS ….. | wSE | □ |
| □ | 551-0320-00 | Cellular Biochemistry (Part II) (Req.: Part I) | Barral | 3 | 2V | SS ….. | wSE | □ |

| | | **Additional Electives** | | **CP** | | **sem.** | **exam** |
|---|---|---|---|---|---|---|---|
| □ | ……. | ……. | ……. | ….. | ….. | ….. ….. | ….. |
| □ | ……. | ……. | ……. | ….. | ….. | ….. ….. | ….. |

**Total Elective Courses of the Major** ……. **(min. 22 CP)**

## Elective Courses in Science in Perspective

| | | | CP | | semester | exam |
|---|---|---|---|---|---|---|
| □ | ……. | ……. | ……. | | ……. | |
| □ | ……. | ……. | ……. | | ……. | |
| **Total Elective Courses Science in Perspective** | | | ……. | **(min. 2 CP)** | | |

## Practical Training (job or research oriented)

| | | | | CP | | semester |
|---|---|---|---|---|---|---|
| □ | 376-2110-00 | Practical Training 12 Weeks | Tutor | 15 | 34P | ……. |
| □ | 376-2111-00 | Practical Training 8 Weeks | Tutor | 10 | 23P | ……. |
| □ | 376-2112-00 | Practical Training 4 Weeks | Tutor | 5 | 11P | ……. |
| **Total Practical Training** | | | | ……. | **(min. 15 CP)** | |

## Research Internship

| | | | | CP | | semester |
|---|---|---|---|---|---|---|
| x | 376-2100-00 | Research Internship<br>(min. 12 weeks full time equivalent)<br>*Planned location:……..* | Tutor | 15 | 36A | ……. |
| **Total Research Internship** | | | | **15** | | |

## Master Thesis

| | | | | CP | | semester |
|---|---|---|---|---|---|---|
| x | 376-2000-00 | Master Thesis<br>(max. 28 weeks full time (incl. 2 weeks holyday), start not before BSc completed)<br>*Planned location:……..* | Superv./Tutor | 30 | 71D | ……. |
| **Total Master Thesis** | | | | **30** | | |

**Comments** (e.g. Additional Admission Requirements)

Zurich, .....

Signed …….. ……..
Student Tutor