



## Facts and figures

<b>Degree:</b>	Master of Science
<b>Subject:</b>	Medical Sciences - Cardiovascular Research
<b>Credits:</b>	60 ECTS
<b>Duration:</b>	2 terms (1 year)
<b>Form:</b>	Full-time
<b>Cohort size:</b>	6 places p.a.
<b>Language:</b>	English
<b>Start:</b>	Winter term (September)
<b>Application:</b>	Online via: <a href="https://campus.uni-freiburg.de">https://campus.uni-freiburg.de</a> March 1 - 31
<b>Application period:</b>	March 1 - 31
<b>Requirements:</b>	MSc or 4-year BSc [240 ECTS] in any STEM or biomedical subject English level proficiency B2

## Selection process

- 1) **Longlisting:** based on assessment of submitted documents
- 2) **Shortlisting:** 30 minutes online video interview with candidates (up to 30 candidates, mid of April)
- 3) **Final selection:** based on 2-day on-site assessment at Freiburg, including a scientific presentation, group discussions, two separate interviews, and the opportunity to meet students, staff, and potential supervisors of MSc and PhD research projects (up to 12 candidates, end of May)
- 4) **Admissions decision:** communicated in early June
- 5) **Award of stipends:** 1,000€/ month/ person; up to 6 p.a.

## Get in touch

CVR-info@msc-medsci.uni-freiburg.de

Or visit us:  
Website

Instagram

LinkedIn



## Course coordinator

Dr. Susanne Tulke  
Institute for Experimental Cardiovascular Medicine  
Medical Center - University of Freiburg  
Medical Faculty of the University of Freiburg  
Elsässer Str. 4C  
79110 Freiburg, Germany



# Medical Sciences - Cardiovascular Research

## Master of Science

Medical Faculty of the University of Freiburg  
Institute for Experimental Cardiovascular Medicine



# Student testimonials



**Susan Chang, USA:** I studied in the inaugural year of the MSc, 2023/24. This master's course provided a unique experience with personalised, near-1:1 guidance from dedicated experts. The interactive learning environment enriched my understanding of the frontiers of cardiovascular research beyond the seminar room. The supportive community and collaborative environment helped me grow academically, and I am now on my journey towards a PhD.



**Jayce Phillips, Canada:** I am currently studying in this Master's programme, as part of a fabulous peer group of friends. I chose this programme due to its multidisciplinary yet focused nature. The small cohort size and interactive tutorials, delivered by distinguished professionals, are providing what I always thought University should be like!



**Helin Duman, Germany:** I joined the programme, knowing that I will do a PhD in cardiac research. The breadth and depth of this course made me apply, and I am proud to have passed the stringent – with three stages, including an on-site invitation – and unexpectedly intriguing selection process, which cared much more about my thinking than my knowing. This was and is a fun journey!



**Mustafa Sibaa, Syria:** In contrast to my STEM-subject peers, I joined this intensive programme after studying medicine. It is remarkable to see how much we can learn from one another, and I am amazed how much more there is to the cardiovascular system than I ever knew or expected. Working closely with experts in a hands-on environment I am enhancing my understanding, in particular of mechanisms of cardiovascular function and disease.



**Hannah Kleitke, Germany:** I joined this unique programme in Freiburg after completing my MSc in *Medical Biotechnology*, to prepare myself for a cardiac PhD research position in Berlin. The course provides me with a thorough understanding of the cardiovascular system, insight into concepts and terminology, and a network of peers and scientists that I will be able to draw on once my PhD project starts.



**Emanuelle Costa, Brazil:** I have been interested in cardiovascular sciences since my undergraduate studies, but I had never imagined a programme with such a unique mix of theoretical knowledge, experimental practice, and a critical thinking-focused curriculum. The intercultural and interdisciplinary small cohort creates a rich and exciting environment for developing our abilities. I see this as an ideal opportunity to build a strong foundation for leading scientific research in the future.

# Course

**Profile:** The English-language MSc Medical Sciences – Cardiovascular Research is a 1-year pre-PhD, combining taught content (first term) and project research (second term). It is dedicated to preparing basic scientists with an MSc or BSc (hons.) in any subject relevant for biomedical sciences for their PhD in the field of cardiovascular research. This structured introduction into 'anything there is to know' about cardiovascular structure and function will lay a solid foundation for independent translational work. It concludes with the award of a Master's degree.

## What's in it for you?

- Delve into the breadth and depth of the cardiovascular system
- Experience a unique learning environment due to the international, interdisciplinary, and integrative nature of the programme
- Optimally prepare for cardiovascular PhD research in a top-class academic setting
- Benefit from a student-centric small cohort teaching and learning concept
- Learn with and from your peers and build a professional network with highly motivated colleagues
- Get the traction needed to subsequently move into independent research

**Competences:** Graduates will gain in-depth expertise in cardiovascular science, from anatomy and physiology to clinical medicine, alongside a strong foundation in medical ethics and research concepts. Students are trained in critical thinking and analytical skills to explore data and information, identify problems, propose solutions and critically evaluate results. With hands-on experience in designing and implementing experiments, trainees will develop advanced practical skills and familiarity with a broad range of techniques in medical sciences, combined with the awareness of good scientific practice in laboratory work. Graduates will be able to perform quantitative and qualitative analyses of the data obtained. Students gain invaluable intercultural communication abilities, including scientific and medical vocabulary relevant for the subject, and become able to clearly and succinctly present scientific thoughts and findings. In short, graduates will be equipped to tackle cutting-edge challenges in cardiovascular medical research.

**Career profile:** Upon completing the programme, graduates will be well-equipped for diverse career opportunities in biomedical sciences. Trainees will be ready to pursue advanced research roles and contribute to innovation in academia, research and development, education, scientific publishing etc.

# Curriculum

## Module 1: The Cardiovascular System (10 ECTS)

This module introduces the structure and function of the cardiovascular system. It gives a thorough overview of cardiovascular anatomy, cell types, molecular mechanisms and biophysical processes underlying cardiovascular function:

- 1.1 Introduction to Cardiovascular Medicine (1 ECTS)
- 1.2 Anatomy & Physiology (3 ECTS)
- 1.3 Molecular & Cell Biology (3 ECTS)
- 1.4 Biochemistry & Biophysics (3 ECTS)

## Module 2: Cardiovascular Disease (6 ECTS)

This module gives an overview of cardiovascular pathologies and how these are targeted by pharmacological agents. The various imaging techniques used to assess cardiovascular anatomy and function in clinical and preclinical settings are introduced:

- 2.1 Pathophysiology & Pharmacology (3 ECTS)
- 2.2 Biomedical & Clinical Imaging (3 ECTS)

## Module 3: Cardiovascular Medicine (5 ECTS)

This module focuses on clinical aspects of cardiovascular diseases and how they are treated non-invasively or with surgical interventions. Additionally, cardiovascular research groups present their cutting-edge science.

- 3.1 Cardiology & Cardiovascular Research (3 ECTS)
- 3.2 Cardiovascular Surgery (2 ECTS)

## Module 4: Methods in Cardiovascular Research (8 ECTS)

This module focuses on developing skills needed for pursuing independent research:

- 4.1 Biomathematics, Statistics & Study Design (3 ECTS)
- 4.2 Accredited animal handling course (2 ECTS)
- 4.3 Student-led seminar (1 ECTS)
- 4.4 Transferable skill courses (2 ECTS)

## Module 5: Master's Thesis (31 ECTS)

The final module features independent, scientific research in cardiovascular sciences (5 months):

- 5.1 Master's Thesis (28+2 ECTS)
- 5.2 Science Day (1 ECTS)