



Courses of the Master's program Biomedical Engineering

| Course Title | Instructors | Faculty | ECTS | |
|------------------------------------|--|----------------------|---------|-----------|
| Basic Modules (30 ECTS) | Basics in Human Medicine (mandatory for students with non-medical background) | | | 15 |
| | Anatomy | N. Friederich | DBE | 6 |
| | Physiology | D. Kunz | DBE | 6 |
| | Biology of Tissue Regeneration | A. Scherberich | DBM/DBE | 3 |
| | Mathematics (mandatory for students with medical/life science background) | | | 15 |
| | Mathematics for Biomedical Engineering I | E. Delgado-Eckert | DBE | 5 |
| | Programming and Statistics for Medical Data Analysis | P. Cattin, P. Sinues | DBE | 4 |
| | Mechanics in Biomedical Engineering | G. Rauter | DBE | 6 |
| | Biomedical Engineering (mandatory for all students) | | | 15 |
| | Materials Science and Biomaterials | B. Müller | DBE | 5 |
| | Principles of Medical Imaging | P. Cattin | DBE | 3 |
| | Clinical Biomechanics | E. Viehweger | DBE | 3 |
| | Data Processing and Control | P. Cattin | DBE | 4 |

Each student attends the courses of the Biomedical Engineering Module and the courses of one of the other 2 Modules (Mathematics OR Basics in Human Medicine)

| | Course Title | Instructors | Faculty | ECTS |
|--|---|----------------|---------|-----------|
| Major Modules (at least 28 ECTS) | Biomaterials Science & Nanotechnology (B. Müller) | | | 28 |
| | Biomedical Acoustics | C. Stieger | DBE | 3 |
| | Cells and Technologies in Regenerative Surgery | A. Scherberich | DBM/DBE | 3 |
| | Digital Dentistry | B. Müller | DBE | 3 |
| | Magnetic Resonance Imaging | O. Bieri | DBE | 3 |
| | Materials in Medicine: Tissue Regeneration | S. Madduri | DBE | 8 |
| | Materials in Medicine: Nanostructure Analysis | B. Müller | DBE | |
| | Applied Engineering in the Hospital | N. Friederich | DBE | 2 |
| | Applied methods in forensic biomedical and toxicological science | C. Lenz | DBE | 2 |
| | Laser and Optics in Medicine | A. Zam | DBE | 4 |
| | Regulatory Affairs and its Applications | P. Cattin | DBE | 2 |
| Einführung in die angewandte Nano-Wissenschaftsethik | R. Andorno | Nano | 3 | |
| Further Modules (32 ECTS) | Free Electives | | | 2 |
| | The students can acquire up to 2 ECTS from a course offered at the university or by learning contract. | | | |
| | Master Thesis | | | 25 |
| | Six-month Master thesis is typically on a clinically relevant challenge in one of the major supervised by an instructor of the program. Master thesis is ideally supervised by a technical expert and a medical doctor. | | | |
| Total | Master Exam | | | 5 |
| | Exam is usually public and takes 45 minutes. Two to four instructors judge the exam. | | | |
| | | | | 90 |

 Each student attends 4 of these 5 mandatory courses

 Each student attends 1 of these 2 mandatory courses

| | Course Title | Instructors | Faculty | ECTS |
|--|---|---------------|---------|-----------|
| Major Modules (at least 28 ECTS) | Image-Guided Therapy (P. Cattin) | | | 28 |
| | Advanced Methods in Medical Image Analysis | P. Cattin | DBE | 6 |
| | Applied Control | G. Rauter | DBE | 5 |
| | Computer-Assisted Surgery | P. Cattin | DBE | 3 |
| | Laser and Optics in Medicine | A. Zam | DBE | 4 |
| | Magnetic Resonance Imaging | O. Bieri | DBE | 3 |
| | Applied Engineering in the Hospital | N. Friederich | DBE | 2 |
| | Biomedical Acoustics | C. Stieger | DBE | 3 |
| | Medical Image Analysis Lab | P. Cattin | DBE | 5 |
| | Rapid Prototyping for Measurement Systems, Automation, Control, Artificial Intelligence, and Virtual Reality | G. Rauter | DBE | 2 |
| | Regulatory Affairs and its Applications | P. Cattin | DBE | 2 |
| Einführung in die angewandte Nano-Wissenschaftsethik | R. Andorno | Nano | 3 | |
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