

## Joint Master's program Biomedical Engineering

<b>Module X4M 1000: Medicine</b>	
Aims:	The students shall acquire basic knowledge in medicine and learn to communicate with physicians adequately.
Workload:	Lecture attendance: 120 h Self-study: 120 h
Credit-points:	8
Person responsible for module:	Jürgen Grein
Courses (lecturer):	Anatomy and Physiology lecture (Grein) Microbiology and Hygiene project (Willkomm)
Language:	English
Curriculum:	Master's program Biomedical Engineering, 1 <sup>st</sup> Semester
<b>Anatomy and Physiology</b>	<b>Lecture, 4 SWS</b>
Prerequisites according to examination regulations:	None
Recommended prerequisites:	Precognition from chemistry-, biology-, and physics-teaching at school
Learning outcomes:	<p>The students shall acquire a basic understanding of all tissues' and organs' structures and functions. They should get to know the commonly used terms, the basic principles of medical thinking, diagnostics and therapy. They shall be able to relate to the single tissues' and organs' productivities and to under what circumstances these can be limited. In addition, they shall learn about the principles to support and replace damaged tissues and organs.</p> <p>Knowledge of the physiological regulation of the most important functions within the human body as well as the application of current technical diagnostic and therapy methods in clinical medicine.</p>
Content:	<p>Basic knowledge in anatomy, cytology and histology</p> <p>Overview on the main organ systems: skeletal and muscle systems, respiratory tract, gastro-intestinal tract, uro-genital tract, central and peripheral nervous systems, blood and defense system</p> <p>Examples are given concerning wide-spread diseases like infections, diabetes, malfunctions of heart, lungs and kidney and mechanical injuries</p> <ol style="list-style-type: none"> <li>1. The cardiovascular system <ol style="list-style-type: none"> <li>a) Heart</li> <li>b) Circulation system</li> </ol> </li> </ol>

	<p>2. General neurophysiology and sensory system</p> <p>a) General neurophysiology</p> <p>b) Sensory system</p> <p>3. Brain function and regulation of hormonal feedback control systems</p> <p>a) Brain function</p> <p>b) Hormonal feedback control systems</p> <p>4. Motor system</p> <p>5. Respiration</p> <p>6. Kidneys</p> <p>7. Gastrointestinal tract and digestion</p> <p>8. Energy metabolism and nutrition</p>
Literature:	<p>Waugh, A, Grant A.: Anatomy and Physiology. Elsevier</p> <p>Drake, R., Wayne Vogl, A., Mitchell, A.: Gray's Anatomy for students. Churchill Livingstone</p> <p>Arthur C. Guyton, John E. Hall: Textbook of Medical Physiology. Amsterdam: Elsevier</p> <p>William H. Howell: A Textbook Of Physiology For Medical Students And Physicians V2. Whitefish: Kessinger</p>
Examination:	Written examination
Teaching methods:	Board, Power-Point-presentation, models, visit of anatomy-institute and demonstration inside anatomic theatre, exercises
<b>Medical Microbiology and Hygiene</b>	<b>Lecture and lab, 4 SWS</b>
Prerequisites according to examination regulations	None
Recommended prerequisites:	Basic knowledge of biology, chemistry, and physics
Learning outcomes:	The students get acquainted with basic knowledge of microbiology and hygiene. A major focus is on medical microbiology and infections which can occur when using medical technology products. In addition, students learn basics about sampling techniques, about the hygienically correct handling of potentially contaminated materials and about the avoidance of contamination by technical staff.
Content:	Basic knowledge of bacteriology, mycology, virology and immunology with an insight into diagnostics in medical microbiology and test systems used. A further focus is on transmission of disease, especially with regard to pathogens in hospitalized patients. In this context, also hygiene of air and water as well as methods of disinfection and sterilization are covered and experimentally explored.
Literature:	Goering et al.: Mims' Medical Microbiology. 5th ed. Elsevier, 2012

Examination:	Written exam and talk (Portfolio)
Teaching methods:	LCD-beamer, microscopes, experiments in the lab