Human Physiology 1–2

Courses: Human Physiology 1 (P-ITMED-0002) and Human Physiology 2 (P-ITMED-0003)
Course Organizer: Department of Physiology, Semmelweis University
Course Coordinator: Prof. Dr. Péter Enyedi
Further Teachers: Dr. Levente Kiss, Dr. Csaba Tímár, and, in Human Physiology 2, Dr. Gábor Petheő
Contact Hours: 3 hours of lectures per week, Monday 13:15-16:00 (3x45 minutes)
Place: designated room of the ITK Building at H-1083 Budapest, Práter u. 50/a

Course Structure: The courses are predominantly theoretical and do not include practical laboratory sessions. Teaching is delivered primarily through classroom lectures, supplemented by opportunities for consultation and discussion. Students' individual preparation is supported by lecture materials, presentations and notes provided by the instructors, and Linda S. Costanzo's Physiology (6th edition or a more recent edition) as the principal recommended textbook.

Assessments:

Formative assessments: 3 times during the semester after major topics
Summative assessment: Oral exam in the exam period

The assessments are designed to determine whether students have acquired an appropriate level of knowledge and understanding of the physiological mechanisms covered by the courses, whether they are able to interpret the functions of individual organ systems in an integrated context, and whether they can recognise the contribution of regulatory mechanisms to normal body function and the maintenance of homeostasis.

Aims: The aim of Human Physiology 1 and Human Physiology 2 is to provide students with a comprehensive and system-oriented understanding of the fundamental cellular, organ-level, and regulatory mechanisms underlying normal human body function. The two consecutive courses provide an essential foundation for subsequent subjects and enable students to interpret physiological processes in an integrated manner, as components of the complex regulatory systems responsible for maintaining homeostasis.

Contents: Human Physiology 1 introduces the fundamental principles of cellular physiology and electrophysiology, including membrane transport, membrane potentials, and the function of excitable cells. The course covers neurotransmission, the regulatory functions of the autonomic nervous system, and the physiology of smooth and skeletal muscle. Students are also introduced to the principal functions of blood, physiological defence mechanisms, and the physiological foundations of immune function. Particular emphasis is placed on cardiovascular physiology, including the mechanical and electrical activity of the heart and the regulation of the circulation. The course also provides a comprehensive overview of respiratory physiology, including the mechanics of breathing, transport of respiratory gases, and regulation of respiration.

Human Physiology 2 builds upon the knowledge acquired during the first course and focuses on additional organ systems and integrative regulatory mechanisms. Students study renal function and urine formation, the regulation of body-fluid volume and osmolality, and the physiological basis of acid–base homeostasis. Gastrointestinal physiology includes the functions of the digestive system, energy metabolism, and regulation of body temperature. Endocrine physiology covers the hypothalamic–pituitary system, adrenal and thyroid function, as well as the regulation of calcium homeostasis and bone metabolism. The neurophysiology component addresses the functional organisation of the nervous system, regulation of motor function, the somatosensory system, and the physiology of vision, hearing, taste, and olfaction.