

Introduction to Medical Science in Space LECTURE

Summer term 2025, Wednesday 17:15-18:45, Room: G28-027

Date	Topic	Lecturer
09.04.2025	Introduction: medical science in space, research areas, questions and technical approaches	Krüger, Melnik
16.04.2025	History of space science (Mercury, Apollo, Vostok, MIR, Skylab etc.)	Abdelfattah
23.04.2025	Physical basics: motions, dynamics of mass points, Newton, gravity, equivalence principle, etc.	Stannarius, Harth
30.04.2025	Platforms for microgravity research I: rotational bioreactors, drop tower, parabolic flight, sounding rockets (suborbital), ballons	Schulz, Torres
07.05.2025	Platforms for microgravity research II: satellites, space stations, typical project planning, campaigns, available flight hardware	Puzyrev
14.05.2025	Cell biology basics: cells, cell organelles, tissues	Krüger
21.05.2025	Gravitational biology: perception of gravity, cell physiology under gravitational stress, gravity experiments with living organisms	Krüger
28.05.2025	Artificial intelligence in space research	Puzyrev, Schulz, Abdelfattah
04.06.2025	Human physiology under microgravity conditions I: musculoskeletal system, cardiovascular system, immune system, typical diseases of astronauts	Schulz, Abdelfattah
11.06.2025	Human physiology under microgravity conditions II: "space pharmacology", bed rest studies, exercise in space, human centrifuges	Wehland, Melnik
18.06.2025	Tissue engineering under microgravity conditions, bioprinting in space	Wehland, Torres
25.06.2025	Genetics and epigenetics in microgravity	Schulz, Abdelfattah
02.07.2025	Technological challenges and strategies in human space exploration: life support systems, space greenhouses, human habitats	Krüger
09.07.2025	EXAM	

Introduction to Medical Science in Space EXERCISE

Summer term 2025, Monday 15:15-16:45, Room: G28-027

Date	Topic	Lecturer
14.04.2025	Literature seminar organization Rotating bioreactors	Schulz, Torres, Melnik, Abdelfattah
28.04.2025	Physical basics: motions, dynamics of mass points, Newton, gravity, equivalence principle, etc.	Physics in Space Group
05.05.2025	Literature seminar I	Schulz, Mushunuri
12.05.2025	Platforms for microgravity research: satellites, space stations, typical project planning, campaigns, available flight hardware	Puzyrev
19.05.2025	Biological systems: tissues, organs, body systems	Krüger
26.05.2025	Working with human cells (in microgravity): cell culture, cell culture environment, microgravity bioreactors, forces and side effects	Krüger
02.06.2025	Body Worlds Exhibition Magdeburg: Comparative anatomy to space effects	Krüger, Burenkova
16.06.2025	Literature seminar II	Schulz, Abdelfattah, Mushunuri
23.06.2025	Molecular biology, genetic engineering	Schulz, Abdelfattah
30.06.2025	Molecular biology, genetic engineering, artificial intelligence	Wehland, Puzyrev
07.07.2025	Life support systems: technology development for biomedical space research: hardware requirements and tests, technical implementations	Krüger