Faculty of Medicine in Rijeka

Curriculum
2026/2027

For course

Sports Physiology

Study program:	**Medical Studies in English (R)** (elective) University integrated undergraduate and graduate study
Department:	**Department of Physiology, Immunology and Pathophysiology**
Course coordinator:	**prof. dr. sc. Mrakovčić-Šutić Ines, dr. med.**
Year of study:	**2**
ECTS:	**1.5**
Incentive ECTS:	**0 (0.00%)**
Foreign language:	**Possibility of teaching in a foreign language**

Course information:

The aim of the course is to acquaint the students with sports training which purpose is to provide developing the special sports skills. Students have to known basic physiological principles and changes in organism during training, following with good planning in development of psychic and motoric abilities. Sports activities during mass-tourism are very often acrobatic and dangerous, requesting good knowledge in physiology of every sport, as well as in possible complications.

During this course, students will be able to easier acquiring the courses of clinical medicine and to better understanding the doctor's role in sport medicine and in touristic ambulances.

Expected course learning outcomes

At the end of the course each student is supposed to acquire general competences:

1. to be able to observe the organism as an integrative system and describe the normal changes of physiological values during physical activities.
2. to give critical opinion of normal functions during physical activities or disruptions of organ functions following sports activities.
3. to know good and bad sites of sports activities.
4. to perceive pathological changes during sports activities.
5. to note what kind of chronic illnesses may be the cause of inability to sports activities.

At the end of the course each student is supposed to acquire specific competences:

1. to understand the principles of physiological feedback mechanisms, to establish homeostatic mechanisms of the main functional systems and changes following sports activities.
2. to critically judge individual conditions on weariness, overtraining and other change physiological functions.
3. to describe normal functions of cardiovascular and respiratory system during physical activities.
4. to describe and understand changes during low oxygen pressure in different alpinist's disciplines, flight, parasailing and space flights.
5. to describe and understand changes during high oxygen pressure in different underwater activities (diving).
6. to get used to research approach in achieving the expected learning outcomes of the course, to get used to team work, to utilize the online literature database (PubMed, Ovid, etc.), to make the qualitative Power point presentation and to present the given thematic unit to other students and a teacher.

Course content

Physiology of sport: normal functions of cardiovascular and respiratory system during physical activities **.** Changes in physiological values of circulation in muscles during physical activities. Adaptations of organism following physical activities. Recreational sports activities. Control of training. Weariness. Overtraining. Biofeedback. Problem-solved seminars. Evidence-based medicine.

Rationalized sports nutrition. Obesity.

Most frequently injuries in correlation with kind of sports activities.

Evaluation methods in kinesiology. Spirometry's changes.

Changes during low oxygen pressure in different alpinist's disciplines, flight, parasailing and space flights. Chronic upper-air disease.

Changes during high oxygen pressure in different underwater activities (SCUBA-diving and complications).

List of assigned reading:

1. Guyton AC, Hall JE. Medical Physiology. Medicinska naklada, jedanaesto izdanje, Zagreb, 2006.
2. Gamulin S, Marušić M, Kovač Z i sur. Patophysiology. Medicinska naklada, šesto izdanje, Zagreb, 2005. (selected chapters).

List of optional reading:

All available journals in the field of sport medicine.

Different Internet databases (Pubmed, Ovid) for sarching the recent articles in the field of sport medicine.

Curriculum:

Lectures list (with titles and explanation):

Lecture 1: Changes in cardiovascular and respiratory system during physical activiy

Normal functions of cardiovascular and respiratory system during physical activities **. Adaptations of organism following physical activities.**

Lecture 2: Overtraining

Control of training. Weariness. Overtraining.

Lecture 3: Changes during low oxygen pressure in different alpinist's disciplines

Chronic upper-air disease

Lecture 4: Changes during high oxygen pressure

Changes during high oxygen pressure in different underwater activities (SCUBA-diving and complications)

Lecture 5: Physical activity and immune response

Changes in innate and acquired immunity during intensive sports activities

Lecture 6: Ergogenic substances

Description of ergogenic substances. Doping

Lecture 7: Sports Nutrition

Specific nutrition of athletes.

Lecture 8: Sports Injuries

Presentation of the most common injuries of athletes characteristic for certain sports.

Lecture 9: Physical activity in Elderly

Sport in people of the third age. Changes in regenerative abilities in the third age of life.
Consequences of physical inactivity.

Lecture 10: Physical activity and CNS functions

Acquisition, maintenance and improvement of psychomorphological abilities during intense effort. CNS response.

Lecture 11: Paraolympic sport

Sports for people with disabilities

Seminar 1: Aerobic and anaerobic exercises

Physiology of aerobic and anaerobic exercise

Seminar 2: Physical activity and rheumatoid disorders

Specifics of physical activity in rheumatic diseases

Seminar 3: Asthma and sports activities

Changes in the respiratory system in asthmatic patients during intense physical exertion

Seminar 4: Physical activity and COPD

To understand the effect and complications of physical activity in patients with COPD

Seminar 5: Endocrinological system disorders and sports activity

To understand sports activities in people with diabetes mellitus; Adrenal cortex dysfunction and sports. Physical activity and thyroid dysfunction

Seminar 6: Digestive system disorders and sports

To understand the specifics of intense physical effort in patients with IBD, Irritable colon.

Seminar 7: Changes in cardiovascular and respiratory system during physical activiy

To understand the changes in blood flow through the muscles and the adaptation of the circulatory system during moderate muscular work and in trained athletes. Presentation of cardiovascular and respiratory diseases and sports activities.

Student obligations:

Regular attendance to lectures and seminars. Preparation of course material to be discussed during seminars

Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Evaluation would be performed according the actual Rules on studies of University of Rijeka (approved by the Senat) and the Faculty of medicine (approved by the Faculty council). In this system, the overall students' outcome is made up 70% of their achievement during the course itself and 30% of the success in the final exam. The oral presentation of particular segment of the course content is obligatory part of the final exam.

Other notes (related to the course) important for students:

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COURSE HOURS 2026/2027

Sports Physiology

Lectures (Place and time or group)

List of lectures, seminars and practicals:

LECTURES (TOPIC)	Number of hours	Location
Lecture 1: Changes in cardiovascular and respiratory system during physical activiy	2	
Lecture 2: Overtraining	2	
Lecture 3: Changes during low oxygen pressure in different alpinist's disciplines	2	
Lecture 4: Changes during high oxygen pressure	1	
Lecture 5: Physical activity and immune response	1	
Lecture 6: Ergogenic substances	1	
Lecture 7: Sports Nutrition	2	
Lecture 8: Sports Injuries	2	
Lecture 9: Physical activity in Elderly	2	
Lecture 10: Physical activity and CNS functions	2	
Lecture 11: Paraolympic sport	1	
Seminar 1: Aerobic and anaerobic exercises	1	
Seminar 2: Physical activity and rheumatoid disorders	1	

Seminar 3: Asthma and sports activities	1	
Seminar 4: Physical activity and COPD	1	
Seminar 5: Endocrinological system disorders and sports activity	1	
Seminar 6: Digestive system disorders and sports	1	
Seminar 7: Changes in cardiovascular and respiratory system during physical activiy	1	

EXAM DATES (final exam):
