UNIVERSITY OF ZAGREB SCHOOL OF MEDICINE

Plan of the course

Physiology

Academic year **2016/2017**

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doc. dr. sc. Vladiana Crljen

I. COURSE AIMS

The overall aim of the Physiology course is to increase understanding of the fundamental mechanisms of how cells, and organ systems function and are regulated under normal physiological conditions but also in how their function is changed in pathological conditions, since some diseases could arise directly from abnormalities in their regulation.

Lecture hours: 24

Seminar hours: 96

Practical hours: 50

Total hours: 170

ECTS 21.0

II. COURSE STRUCTURE

Course hours:

Lectures: 24

Seminar: 96

Practicum: 50

Total hours: 170

Physiology curriculum is organized into learning units based on major body systems and functions as:

Cell, muscle physiology, cardiovascular physiology, respiratory physiology, physiology of flying and diving, renal physiology, gastrointestinal physiology, metabolism and thermoregulation, physiology of the endocrine system, physiology of the pregnancy and lactation, fetal and newborn physiology, physiology of the sport.

III. PLAN OF THE COURSE AND COURSE SCHEDULE

BLOCKS OF THE COURSE

Number of blocks: **1**

Block number	Start	End
1.	16.1.2017	3.4.2017

BLOCKS OF THE COURSE

Number of blocks: **1**

Block number	Start	End
1.	16.1.2017	3.4.2017

BLOCKS OF THE COURSE SHEME

Block 1

Date	Time	Group	Course hours type	Theme	Teaching staff
Thursday 8.12.2016.	09:00-10:00; MEF Nova vijećnica	ALL	Exam	EXAM	doc. dr. sc. Tomislav Kelava
Monday 16.1.2017.	08:00-08:45; MEF Fiziologija Predavaonica		Lectures	INTRODUCING THE PHYSIOLOGY COURSE	doc. dr. sc. Vladiana Crljen
	08:45-10:15; MEF Fiziologija Predavaonica	ALL	Lectures	INTORDUCTION and MEMBRANE TRANSPORT	izv. prof. dr. sc. Mirza Žižak
	10:15-12:30; MEF Fiziologija Predavaonica	A	Seminar	CELL	izv. prof. dr. sc. Mirza Žižak
	12:45-15:00; MEF Fiziologija Predavaonica	B	Seminar	CELL	izv. prof. dr. sc. Mirza Žižak
Tuesday 17.1.2017.	08:30-10:45; MEF Kompjutorska učionica	A	Practicum	MEMBRANE POTENTIAL part 1	izv. prof. dr. sc. Mirza Žižak, Alan Šućur, dr. med., Nikola Habek, dr. med.
	11:15-13:30; MEF Fiziologija Predavaonica	A	Seminar	MUSCLE	prof. dr. sc. Hrvoje Banfić
	14:00-16:15; MEF Kompjutorska učionica	B	Practicum	MEMBRANE POTENTIAL part 1	doc. dr. sc. Tomislav Kelava, dr. sc. Hrvoje Lalić, Darja Flegar, dr. med.
Wednesday 18.1.2017.	08:30-10:45; MEF Fiziologija Predavaonica	B	Seminar	MUSCLE	prof. dr. sc. Hrvoje Banfić
	11:00-13:15; MEF Kompjutorska učionica	B	Practicum	MEMBRANE POTENTIAL part 2	doc. dr. sc. Tomislav Kelava, dr. sc. Hrvoje Lalić, Darja Flegar, dr. med.
	14:00-16:15; MEF Kompjutorska učionica	A	Practicum	MEMBRANE POTENTIAL part 2	izv. prof. dr. sc. Mirza Žižak, Alan Šućur, dr. med., Nikola Habek, dr. med.
Thursday 19.1.2017.	08:30-09:15; MEF Wickerhauser		Lectures	INTORDUCING CARDIOVASCULAR SYSTEM	izv. prof. dr. sc. Mirza Žižak
	09:30-11:45; MEF Wickerhauser	A	Seminar	HEART I	izv. prof. dr. sc. Mirza Žižak
	12:00-14:15; MEF Wickerhauser	B	Seminar	HEART I	izv. prof. dr. sc. Mirza Žižak
Friday 20.1.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	HEART II	doc. dr. sc. Vesna Lukinović-Škudar
	10:30-12:45; MEF Wickerhauser	B	Seminar	HEART II	dr. sc. Hrvoje Lalić
Monday 23.1.2017.	08:00-10:15; MEF Kompjutorska učionica	A	Seminar	ECG	izv. prof. dr. sc. Mirza Žižak

Date	Time	Group	Course hours type	Theme	Teaching staff
	10:30-13:30; MEF Fiziologija I kat	A	Practicum	ECG, RR	izv. prof. dr. sc. Aleksandra Dugandžić, Vilma Dembitz, dr. med., Nikola Habek, dr. med.
	13:30-15:45; MEF Wickerhauser	B	Seminar	ECG	izv. prof. dr. sc. Mirza Žižak
	16:30-19:30; MEF Fiziologija I kat	B	Practicum	ECG, RR	izv. prof. dr. sc. Aleksandra Dugandžić, doc. dr. sc. Tomislav Kelava, Darja Flegar, dr. med.
Tuesday 24.1.2017.	08:30-10:00; MEF Wickerhauser	ALL	Lectures	INTRODUCING CIRCULATION; LAPLACE LAW	doc. dr. sc. Vladiana Crljen
	10:15-12:30; MEF Fiziologija Predavaonica	A	Seminar	CIRCULATION I- Arterial pressure and circulation	doc. dr. sc. Tomislav Kelava
	12:45-15:00; MEF Fiziologija Predavaonica	B	Seminar	CIRCULATION I- Arterial pressure and circulation	doc. dr. sc. Tomislav Kelava
Wednesday 25.1.2017.	10:30-12:45; MEF Fiziologija Predavaonica	B	Seminar	MICROCIRCULATION	izv. prof. dr. sc. Aleksandra Dugandžić
	11:30-14:30; MEF Fiziologija Vježbaonica	A	Practicum	PLETISMOGRAPHY, POLYGRAPHY	dr. sc. Hrvoje Lalić, doc. dr. sc. Tomislav Kelava, Nikola Habek, dr. med.
	15:15-17:30; MEF Fiziologija Predavaonica	A	Seminar	MICROCIRCULATION	izv. prof. dr. sc. Aleksandra Dugandžić
Thursday 26.1.2017.	08:00-10:15; MEF Fiziologija Predavaonica	B	Seminar	CIRCULATIONIII-CO&venous return, spec.org. circulation	izv. prof. dr. sc. Mirza Žižak
	10:30-11:15; MEF Fiziologija Predavaonica	ALL	Seminar	AUTONOMIC NERVOUS SYSTEM	doc. dr. sc. Marija Renić
	11:30-13:45; MEF Fiziologija Predavaonica	A	Seminar	CIRCULATIONIII-CO&venous return, spec.org. circulation	izv. prof. dr. sc. Mirza Žižak
Friday 27.1.2017.	09:00-11:15; MEF Wickerhauser	A	Seminar	CIRCULATION II Regulation of arterial pressure	doc. dr. sc. Vladiana Crljen
	11:30-13:45; MEF Wickerhauser	B	Seminar	CIRCULATION II Regulation of arterial pressure	doc. dr. sc. Vladiana Crljen
	14:30-17:30; MEF Fiziologija Vježbaonica	B	Practicum	PLETISMOGRAPHY, POLYGRAPHY	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med., Darja Flegar, dr. med.
Monday 30.1.2017.	08:30-10:00; MEF Čačković	ALL	Lectures	BLOOD CLOTTING	izv. prof. dr. sc. Mirza Žižak
	10:15-12:30; MEF Fiziologija I kat	A	Practicum	BLOOD CLOTTING	doc. dr. sc. Vesna Lukinović-Škudar, Vilma Dembitz, dr. med., Nikola Habek, dr. med.

Date	Time	Group	Course hours type	Theme	Teaching staff
	12:45-15:00; MEF Fiziologija I kat	B	Practicum	BLOOD CLOTTING	Vilma Dembitz, dr. med., Alan Šućur, dr. med., Darja Flegar, dr. med.
Tuesday 31.1.2017.	08:30-10:00; MEF Fiziologija Predavaonica	A	Seminar	INTEGRATION I	izv. prof. dr. sc. Mirza Žižak
	10:30-12:00; MEF Fiziologija Predavaonica	B	Seminar	INTEGRATION I	izv. prof. dr. sc. Mirza Žižak
Wednesday 1.2.2017.	08:30-12:15; MEF Fiziologija Vježbaonica	A	Practicum	ERYTHROCYTE COUNT, Ht, Hb	izv. prof. dr. sc. Aleksandra Dugandžić, doc. dr. sc. Tomislav Kelava, Nikola Habek, dr. med.
	13:00-16:45; MEF Fiziologija Vježbaonica	B	Practicum	ERYTHROCYTE COUNT, Ht, Hb	doc. dr. sc. Vesna Lukinović-Škudar, doc. dr. sc. Tomislav Kelava, Darja Flegar, dr. med.
Friday 3.2.2017.	13:00-14:30; MEF Fiziologija Vježbaonica	ALL	Seminar	INTEGRATION I (CELL AND CVS)/TEST	izv. prof. dr. sc. Mirza Žižak
	13:00-14:30; MEF Čačković	ALL	Seminar	INTEGRATION I (CELL and CVS)/TEST	doc. dr. sc. Tomislav Kelava
Tuesday 7.2.2017.	08:30-09:30; MEF Čačković	ALL	Exam	COLLOQUIUM P1	doc. dr. sc. Vesna Lukinović-Škudar
	08:30-09:30; MEF Nova vijećnica	ALL	Exam	COLLOQUIUM P1	doc. dr. sc. Tomislav Kelava
	10:00-11:00; MEF Čačković	SVI	Exam	Provjera znanja	doc. dr. sc. Vesna Lukinović-Škudar
	10:00-11:00; MEF Nova vijećnica	SVI	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	11:00-12:30; MEF Fiziologija Predavaonica	ALL	Lectures	INTRODUCTION RESPIRATORY SYSTEM	prof. dr. sc. Dora Višnjić
Wednesday 8.2.2017.	08:30-10:45; MEF Mašek	A	Seminar	RESPIRATION I -Pulmonary ventilation and circulation	prof. dr. sc. Dora Višnjić
	11:00-13:15; MEF Fiziologija Predavaonica	B	Seminar	RESPIRATION I -Pulmonary ventilation and circulation	prof. dr. sc. Dora Višnjić
	14:00-17:00; MEF Fiziologija Vježbaonica	B	Practicum	SPIROMETRY	doc. dr. sc. Vesna Lukinović-Škudar, dr. sc. Hrvoje Lalić, Darja Flegar, dr. med.
Thursday 9.2.2017.	08:00-10:15; MEF Wickerhauser	B	Seminar	RESPIRATIONII-Principles of gasexchange;CO2&O2transp	prof. dr. sc. Dora Višnjić
	11:45-14:00; MEF Nova vijećnica	A	Seminar	RESPIRATIONII-Principles of gasexchange;CO2&O2transp	prof. dr. sc. Dora Višnjić
	14:30-17:30; MEF Fiziologija Vježbaonica	A	Practicum	SPIROMETRY	doc. dr. sc. Vesna Lukinović-Škudar, doc. dr. sc. Tomislav Kelava, Nikola Habek, dr. med.
Friday 10.2.2017.	08:30-10:45; MEF Wickerhauser	A	Seminar	RESPIRATION III- Regulation of respiration	doc. dr. sc. Vesna Lukinović-Škudar

Date	Time	Group	Course hours type	Theme	Teaching staff
	11:00-12:30; MEF Wickerhauser	ALL	Lectures	FLYING AND DIVING	izv. prof. dr. sc. Aleksandra Dugandžić
	12:45-15:00; MEF Wickerhauser	B	Seminar	RESPIRATION III- Regulation of respiration	doc. dr. sc. Vesna Lukinović-Škudar
Monday 13.2.2017.	08:00-09:30; MEF Fiziologija Predavaonica	A	Seminar	INTEGRATION II	prof. dr. sc. Dora Višnjić
	09:45-11:15; MEF Fiziologija Predavaonica	B	Seminar	INTEGRATION II	prof. dr. sc. Dora Višnjić
Tuesday 14.2.2017.	08:15-09:45; MEF Biološka	ALL	Seminar	INTEGRATION II (Respiratory system)/TEST	prof. dr. sc. Dora Višnjić
	08:15-09:45; MEF Fiziologija Vježbaonica	ALL	Lectures	INTEGRATION II (Respiratory system)/TEST	doc. dr. sc. Vesna Lukinović-Škudar
	12:00-13:30; MEF Fiziologija Predavaonica	ALL	Lectures	INTRODUCING RENAL SYSTEM	prof. dr. sc. Hrvoje Banfić
Wednesday 15.2.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	BODY FLUIDS	doc. dr. sc. Vesna Lukinović-Škudar
	10:30-12:45; MEF Wickerhauser	B	Seminar	BODY FLUIDS	doc. dr. sc. Vesna Lukinović-Škudar
Thursday 16.2.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	KIDNEY I - Structure, GFR, Clearance	izv. prof. dr. sc. Mirza Žižak
	10:30-12:45; MEF Wickerhauser	B	Seminar	KIDNEY I - Structure, GFR, Clearance	izv. prof. dr. sc. Mirza Žižak
Friday 17.2.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	KIDNEY II-Tub trans.&proc.,Reg.of K,Ca,HPO4&Mg	doc. dr. sc. Vladiana Crljen
	10:30-13:30; MEF Fiziologija I kat	B	Practicum	PROBLEM SOLVING	doc. dr. sc. Vladiana Crljen, Alan Šućur, dr. med., Vilma Dembitz, dr. med.
	14:00-16:15; MEF Wickerhauser	B	Seminar	KIDNEY II-Tub trans.&proc.,Reg.of K,Ca,HPO4&Mg	doc. dr. sc. Vladiana Crljen
Monday 20.2.2017.	08:00-11:00; MEF Fiziologija I kat	A	Practicum	PROBLEM SOLVING	doc. dr. sc. Vladiana Crljen, Alan Šućur, dr. med., Vilma Dembitz, dr. med.
	11:15-13:30; MEF Wickerhauser	A	Seminar	KIDNEYIII-Regulation of ECV&osmolarity, Urine conc	doc. dr. sc. Vladiana Crljen
	14:00-16:15; MEF Wickerhauser	B	Seminar	KIDNEYIII-Regulation of ECV&osmolarity, Urine conc	Vilma Dembitz, dr. med.
Tuesday 21.2.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	ACID BASE BALANCE	prof. dr. sc. Hrvoje Banfić
	10:30-12:45; MEF Wickerhauser	B	Seminar	ACID BASE BALANCE	prof. dr. sc. Hrvoje Banfić
Wednesday 22.2.2017.	09:00-10:30; MEF Mašek	A	Seminar	INTEGRATION III	doc. dr. sc. Vladiana Crljen

Date	Time	Group	Course hours type	Theme	Teaching staff
	10:45-12:15; MEF Mašek	B	Seminar	INTEGRATION III	doc. dr. sc. Vladiana Crljen
Thursday 23.2.2017.	10:00-11:30; MEF Čačković	ALL	Seminar	INTEGRATION III (Renal system)/TEST	doc. dr. sc. Vladiana Crljen
	10:00-11:30; MEF Nova vijećnica	ALL	Seminar	INTEGRATION III (Renal system)/TEST	Alan Šućur, dr. med.
Tuesday 28.2.2017.	10:15-11:45; MEF Čačković	ALL	Lectures	COLLOQUIUM P2	prof. dr. sc. Dora Višnjić
	10:15-11:45; MEF Nova vijećnica	ALL	Lectures	COLLOQUIUM P2	dr. sc. Hrvoje Lalić
	12:30-14:00; MEF Nova vijećnica	ALL	Lectures	INTRODUCING GASTROINTESTINAL PHYSIOLOGY	prof. dr. sc. Hrvoje Banfić
Wednesday 1.3.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	-Principles of GI function, motility, nervous control, circula	doc. dr. sc. Vesna Lukinović-Škudar
	10:30-12:45; MEF Wickerhauser	B	Seminar	-Principles of GI function, motility, nervous control, circula	doc. dr. sc. Vesna Lukinović-Škudar
Thursday 2.3.2017.	11:00-13:15; MEF Nova vijećnica	A	Seminar	GI II - Secretory functions, digestion and absorption	prof. dr. sc. Dora Višnjić
	13:30-15:45; MEF Nova vijećnica	B	Seminar	GI II - Secretory functions, digestion and absorption	prof. dr. sc. Dora Višnjić
Friday 3.3.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	GI III - Metab. of carbohydrates, lipids and proteins	prof. dr. sc. Hrvoje Banfić
	10:30-12:45; MEF Wickerhauser	B	Seminar	GI III - Metab. of carbohydrates, lipids and proteins	prof. dr. sc. Hrvoje Banfić
Monday 6.3.2017.	08:00-10:15; MEF (C) - Šercer	A	Seminar	TERMOREGUALTION, METABOLISM	doc. dr. sc. Vladiana Crljen
	10:30-12:45; MEF (C) - Šercer	B	Seminar	TERMOREGUALTION, METABOLISM	doc. dr. sc. Vladiana Crljen
Tuesday 7.3.2017.	09:30-11:00; MEF (C) - Šercer	A	Seminar	INTEGRATION IV	doc. dr. sc. Vesna Lukinović-Škudar
	11:15-12:45; MEF (C) - Šercer	B	Seminar	INTEGRATION IV	doc. dr. sc. Vesna Lukinović-Škudar
Wednesday 8.3.2017.	12:45-15:45; MEF Fiziologija I kat	A	Practicum	BASAL METABOLISM	doc. dr. sc. Vladiana Crljen, dr. sc. Hrvoje Lalić, Alan Šućur, dr. med.
	16:00-19:00; MEF Fiziologija I kat	B	Practicum	BASAL METABOLISM	doc. dr. sc. Vladiana Crljen, Vilma Dembitz, dr. med., Alan Šućur, dr. med.
Thursday 9.3.2017.	10:00-11:30; MEF Čačković	ALL	Seminar	INTEGRATION IV (GI PHYSIOLOGY)/TEST	doc. dr. sc. Vesna Lukinović-Škudar
	10:00-11:30; MEF Nova vijećnica	ALL	Seminar	INTEGRATION IV (GI PHYSIOLOGY)/TEST	Darja Flegar, dr. med.
	12:00-13:30; MEF Čačković	ALL	Lectures	INTRODUCING ENDOCRINE SYSTEM	prof. dr. sc. Dora Višnjić

Date	Time	Group	Course hours type	Theme	Teaching staff
Friday 10.3.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	PITUITARY GLAND	izv. prof. dr. sc. Aleksandra Dugandžić
	10:30-12:45; MEF Wickerhauser	B	Seminar	PITUITARY GLAND	izv. prof. dr. sc. Aleksandra Dugandžić
Monday 13.3.2017.	08:00-10:15; MEF Wickerhauser	A	Seminar	THYROID GLAND	doc. dr. sc. Vesna Lukinović-Škudar
	10:30-12:45; MEF Wickerhauser	B	Seminar	THYROID GLAND	doc. dr. sc. Vesna Lukinović-Škudar
Tuesday 14.3.2017.	08:00-10:15; MEF Wickerhauser	B	Seminar	REPRODUCTIVE PHYSIOLOGY	izv. prof. dr. sc. Aleksandra Dugandžić
	10:30-12:45; MEF Wickerhauser	A	Seminar	REPRODUCTIVE PHYSIOLOGY	izv. prof. dr. sc. Aleksandra Dugandžić
Wednesday 15.3.2017.	12:00-14:15; MEF Wickerhauser	B	Seminar	CALCIUM, PHOSPHATE BALANCE	prof. dr. sc. Dora Višnjić
	14:30-16:45; MEF Wickerhauser	A	Seminar	CALCIUM, PHOSPHATE BALANCE	prof. dr. sc. Dora Višnjić
	17:00-20:00; MEF Fiziologija I kat	A	Practicum	THORN	Vilma Dembitz, dr. med., Alan Šućur, dr. med., dr. sc. Hrvoje Lalić
Thursday 16.3.2017.	12:00-14:15; MEF Wickerhauser	A	Seminar	ADRENAL GLAND	izv. prof. dr. sc. Aleksandra Dugandžić
	14:30-16:45; MEF Wickerhauser	B	Seminar	ADRENAL GLAND	izv. prof. dr. sc. Aleksandra Dugandžić
	17:00-20:00; MEF Fiziologija Vježbaonica	B	Practicum	THORN	doc. dr. sc. Vladiana Crljen, Alan Šućur, dr. med., dr. sc. Hrvoje Lalić
Friday 17.3.2017.	09:00-12:00; MEF Fiziologija I kat	A	Practicum	THYR HORMONE & O2 CONSUMPTION IN RATS	doc. dr. sc. Vladiana Crljen, dr. sc. Hrvoje Lalić, Vilma Dembitz, dr. med.
	13:00-16:00; MEF Fiziologija I kat	B	Practicum	THYR HORMONE & O2 CONSUMPTION IN RATS	dr. sc. Hrvoje Lalić, Vilma Dembitz, dr. med., Alan Šućur, dr. med.
Monday 20.3.2017.	13:15-15:30; MEF Wickerhauser	A	Seminar	BLOOD GLUCOSE, INSULIN, GLUCAGON	prof. dr. sc. Dora Višnjić
	16:00-19:00; MEF Fiziologija I kat	A	Seminar	OGTT	dr. sc. Hrvoje Lalić, Vilma Dembitz, dr. med., Alan Šućur, dr. med.
Tuesday 21.3.2017.	13:15-15:30; MEF Wickerhauser	B	Seminar	BLOOD GLUCOSE, INSULIN, GLUCAGON	prof. dr. sc. Dora Višnjić
	16:00-19:00; MEF Fiziologija I kat	B	Practicum	OGTT	dr. sc. Hrvoje Lalić, Vilma Dembitz, dr. med., Alan Šućur, dr. med.
Wednesday 22.3.2017.	08:00-09:30; MEF Fiziologija Predavaonica	ALL	Lectures	PREGNANCY AND LACTATION	doc. dr. sc. Vesna Lukinović-Škudar

Date	Time	Group	Course hours type	Theme	Teaching staff
	09:45-11:15; MEF Fiziologija Predavaonica	ALL	Lectures	FETAL AND NEWBORN PHYSIOLOGY	doc. dr. sc. Tomislav Kelava
	12:00-15:00; MEF Fiziologija Vježbaonica	A	Practicum	ÅSTRAND	doc. dr. sc. Tomislav Kelava, Vilma Dembitz, dr. med., dr. sc. Hrvoje Lalić
	15:15-18:15; MEF Fiziologija Vježbaonica	B	Practicum	ÅSTRAND	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med., dr. sc. Hrvoje Lalić
Thursday 23.3.2017.	08:00-09:30; MEF Wickerhauser	A	Seminar	INTEGRATION V	izv. prof. dr. sc. Aleksandra Dugandžić
	09:45-11:15; MEF Wickerhauser	ALL	Lectures	SPORTS PHYSIOLOGY	prof. dr. sc. Hrvoje Banfić
	11:30-13:00; MEF Wickerhauser	B	Seminar	INTEGRATION V	izv. prof. dr. sc. Aleksandra Dugandžić
Friday 24.3.2017.	10:00-11:30; MEF Čačković	ALL	Seminar	INTEGR V (End.S.;Preg.Lac.; Fet.New; Spor.) /TEST	izv. prof. dr. sc. Aleksandra Dugandžić
	10:00-11:30; MEF Nova vijećnica	ALL	Seminar	INTEGR V (End.S.;Preg.Lac.; Fet.New; Spor.) /TEST	Nikola Habek, dr. med.
Tuesday 28.3.2017.	10:00-11:00; MEF Nova vijećnica	ALL	Exam	COLLOQUIUM P3	Nikola Habek, dr. med.
	10:00-11:00; MEF Biološka	ALL	Exam	COLLOQUIUM P3	izv. prof. dr. sc. Aleksandra Dugandžić
Friday 31.3.2017.	13:30-14:30; MEF Čačković	ALL	Exam	COLLOQUIUM P1 OR P2	doc. dr. sc. Vladiana Crljen
	13:30-14:30; MEF Nova vijećnica	ALL	Exam	COLLOQUIUM P1 OR P2	doc. dr. sc. Tomislav Kelava
Wednesday 5.7.2017.	08:30-09:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med.
	08:30-09:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	10:00-11:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med.
	10:00-11:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	11:30-12:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med.
	11:30-12:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	13:00-14:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med.

Date	Time	Group	Course hours type	Theme	Teaching staff
	13:00-14:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	14:30-15:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava, Alan Šućur, dr. med.
	14:30-15:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
Thursday 20.7.2017.	08:30-09:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	08:30-09:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	10:00-11:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	10:00-11:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	11:30-12:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	11:30-12:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	13:00-14:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	13:00-14:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	14:30-15:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med., doc. dr. sc. Vladiana Crljen
	14:30-15:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
Thursday 7.9.2017.	08:30-09:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	08:30-09:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	10:00-11:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	10:00-11:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	11:30-12:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	11:30-12:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	13:00-14:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	13:00-14:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.

Date	Time	Group	Course hours type	Theme	Teaching staff
	14:30-15:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	14:30-15:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
Thursday 21.9.2017.	08:30-09:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	08:30-09:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	10:00-11:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	10:00-11:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	11:30-12:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	11:30-12:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	13:00-14:00; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	13:00-14:00; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava
	14:30-15:30; MEF Fiziologija Vježbaonica	ALL	Exam	Provjera znanja	Darja Flegar, dr. med.
	14:30-15:30; MEF Fiziologija Predavaonica	ALL	Exam	Provjera znanja	doc. dr. sc. Tomislav Kelava

Lectures:

1. Introducing membrane transport (2)
2. Introducing cardiovascular system (1)
3. Introducing circulation; Laplace law (2)
4. Autonomic nervous system (1)
5. Blood clotting (2)
6. Introducing respiratory system (2)
7. Flying and diving (2)
8. Introducing renal system (2)
9. Introducing gastrointestinal physiology (2)
10. Introducing endocrine system (2)
11. Pregnancy and lactation (2)
12. Fetal and Newborn Physiology (2)
13. Sports Physiology (2)

Seminar topics:

S	SEMINAR TITLE	Theme	Chapter
1	CELL (3)	Cell & membrane potential	4, 5
2	MUSCLE (3)	Structure of skeletal, smooth muscle, mechanism of contraction, control of skeletal muscle contraction excitation – contraction coupling, neuromuscular transmission, mechanics and energetic of skeletal muscle contraction, smooth muscle	6,7,8
3	HEART I (3)	Cardiac muscle characteristic; Electrophysiology of heart	9 (p 106-109), 10
4	HEART II (3)	Cardiac function, cardiac cycle, cardiac defects (heart sounds)	9, 23 (p 283-285)
5	ECG, VECTOR ANALYSIS (3)	Electrocardiogram (ECG); Vector analysis	11, 12
6	CIRCULATION I (3)	Arterial pressure and circulation	14, 15
7	MICROCIRCULATION (3)	Fluid dynamics, the microcirculation and lymphatic; Local control of blood flow	16, 17
8	CIRCULATION II (3)	Regulation of arterial pressure,	18, 19
9	CIRCULATION III (3)	Cardiac output and venous return; Coronary circulation, skeletal muscle circulation	20, 21 (p 259-264)
10	INTEGRATION I (3)	Case: Hypovolemic shock* Case: Acute myocardial infarction* TEST	4-21
11	RESPIRATION I (3)	Pulmonary ventilation; Pulmonary circulation	38, 39

12	RESPIRATION II (3)	Principles of gas exchange; Oxygen and carbon dioxide transport	40, 41
13	RESPIRATION III (3)	Regulation of respiration	42
14	INTEGRATION II (3)	Case: Obstructive lung disease* TEST	31, 38-42; 43 (p 549-551)
15	BODY FLUIDS AND ELECTROLYTES (3)	Edema, hyperhidration, dehydration	25
16	KIDNEY I (3)	Structure of kidney and nephrons, glomerular filtration rate; Renal hemodynamics; Renal clearance	26, 27 28 (p365-368)
17	KIDNEY II (3)	Transport and processing properties of tubular segments; Regulation of potassium, calcium, phosphate and magnesium	28 (p 347-365), 30 (p 389-399)
18	KIDNEY III (3)	Regulation of extracellular fluid volume and osmolarity; Urine concentration and dilution; Micturation; Dialysis	29, 30 (p 401--408), 32 (p 427-429, p 440-441)
19	ACID–BASE BALANCE (3)	Acid-Base Balance	31
20	INTEGRATION III (3)	Case: Acute glomerulonephritis* Case: Secondary arterial hypertension* TEST	25-31 (32)
21	GASTROINTESTINAL SYSTEM I (3)	Principles of gastrointestinal function: motility, nervous control, blood circulation; Reflexes, Propulsion and mixing of food	63, 64
22	GASTROINTESTINAL SYSTEM II (3)	Secretory functions; Digestion and absorption	65, 66
23	GASTROINTESTINAL SYSTEM III (3)	Metabolism of carbohydrates, lipids, and proteins; Bilirubin, bile secretion, carbohydrate, nitrogen, lipid and protein metabolism, conjugation and detoxification; Liver	68, 69, 70, 71
24	TERMOREGULATION AND METABOLISM (3)	Dietary balances, regulation of feeding; Metabolic rate; Regulation of body temperature	72, 73, 74

25	INTEGRATION IV (3)	Case: Gastrointestinal system* TEST	63-74
26	PITUITARY GLAND HORMONES (3)	Pituitary hormones	76
27	THYROID GLAND HORMONES (3)	Thyroid metabolic hormones	77
28	ADRENOCORTICAL HORMONES (3)	Mineralocorticoids; Glucocorticoids	78
29	CALCIUM AND PHOSPHATE BALANCE (3)	Calcium and phosphate metabolism, vitamin D; PTH and Calcitonin	80
30	REGULATION OF BLOOD GLUCOSE CONCENTRATION (3)	Insulin, glucagon, liver, skeletal muscle, cortisol, catecholamine, growth hormone, tyrosine	79
31	REPRODUCTIVE PHYSIOLOGY (3)	Male hormone; Female hormone	81, 82
32	INTEGRATION V (3)	Cardiovascular changes, respiratory changes, kidney response, insulin sensitivity and glucose uptake, health benefits, endocrine changes	76-82

PRACTICAL WORK:

Students will be introduced through practical work to diagnostic tests that are routinely used in medicine. Due to ethical reasons some of the exercises will be performed on animals (laboratory rats). In that way we will also show our students how to work with laboratory animals, what can be helpful in their future scientific work. Also some of the exercises are designed as scientific experiments. In line with that, some practicals are designed as scintific experiments. When it is possible, the animal experiments are replaced with computer simulation.

Practical work topics:

1. MEMBRANE POTENTIAL - PART 1 and 2 (6) - LMS, Gu. 4, 5

2. ECG. MEASURING ARTERIAL BLOOD PRESSURE. (4) - LMS, Gu 11, 12, 14 (p 172-173; 174), 15 (180-184)

3. ERYTROCYTE COUNT. HAEMOGLOBIN. HEMATOCRIT. SEDIMENTATION RATE. (5) - LMS, Gu 33

4. BLOOD CLOTTING TESTS (3) - LMS, Gu 37

5. PLETISMOGRAPHY, POLIGRAPHY (4) - LMS

6. SPIROMETRY (4) - LMS, Gu 38 (p 501-503); 43 (p 549-551)

7. PROBLEM SOLVING (model KIDNEY); ERYTROCYTE - MEMBRANE RESISTANCY (4) - LMS, Gu 26, 27, 28, 29

8. MEASURING THE RATE OF BASAL METABOLISM IN HUMAN. (4) - LMS, Gu 73 (p 905-909)

9. EFFECT OF THYROID HORMONE ON OXYGEN CONSUMPTION IN RAT (4) - LMS, Gu 77 (p 954-956)

10. THORN TEST. INDUCING THE HYPOCALCIEMIC TETANY IN RAT. (4) - LMS, Gu 80 (p 1001-1003)

11. GLUCOSE TOLERANS TEST. INSULIN INDUCED HYPOGLYCEMIA IN RAT (4) - LMS, Gu 79 (p 993-998)

12. CHANGES IN CARDIOVASCULAR SYSTEM INDUCED BY MUSCLE WORK. ASTRAND. EMG (4)- LMS

Students should come prepared to practicals. Description of each practical is given on the LMS. Also, students should read textbook (Guyton) to get ready for practical. Next to each practical listed above is given chapter(s) from textbook that should be prepared in advance.

Šalata 3– Departement of Physiology

Lecture room (PL) and practical room (PP, PP2)

Lectures will take place in hall: **Physiology lecture room (PL) or available lecture room (L) in main building according to schedule**

Seminars will take place in hall: **Physiology lecture room (PL) or available lecture room (L) in main building according to schedule**

IV. EXAMINATIONS

IV.a. EXAM POLICY:

Exam questions will include material presented in lecture, assigned chapter readings and case studies distributed during class or posted on the course web site. Questions are multiple choice with only one correct answer. Each question accounts for one point and **there are no negative points**.

Major colloquium quizzes

Three major colloquium quizzes will be held during the course. These quizzes are named Ph-1, Ph-2 and Ph-3 colloquium. Each quiz is made up of 60 multiple choice questions equally distributed through textbook obligatory chapters.

- Ph1 colloquium - includes general physiology, muscle physiology and the cardiovascular system (topics covered in lectures 1-5, seminars 1-10 and practical work 1-5),
- Ph2 colloquium - includes physiology of kidney and respiratory system (topics covered in lectures 6-8, seminars 11-20 and practical work 6-7),
- Ph3 colloquium - includes physiology of digestive system, metabolism and endocrinology (topics covered inlectures 9-13, seminars 20-32 and practical work 8-12)

Students are given 90 minutes to complete each colloquium quiz. The score of each colloquium (P1-P3) contributes 33.3% to the final grade at the end of the course.

IMPORTANT!

The Physiology department strongly encourages students to take and pass the major colloquium quizzes since it gives the students a great opportunity to "carry" the passing grades, achieved on each of three colloquium quizzes, from one to another final exam.

(e.g. if student passed the Ph1 colloquium quiz he does not need to retake the Ph1 part of the final exam again during current academic year 2016./17.)

Bonus points *(points earned on the small integration quizzes)*

During the course students have obligation to take integration tests. There are five integration tests (after each physiology

functional unit there is integration test). Passing these tests gives our students opportunity to earn bonus points. The bonus points earned during the course will be added to the total score of each of the corresponding colloquium quizzes (P1-P3). The bonus points will be added only if student earned 55% or more of the total score on the corresponding colloquium quizzes

Final exam

The Final Exam is composed from two parts: written test and oral exam. To qualify for the oral exam student must pass the written exam.

- **Written test** is composed of three parts: P1 + P2 + P3. Exam writers are given 90 minutes to complete each test part with 30 min break between each part.

Written part of exam has the elimination threshold. Student need to have average score 55% or more on each part of the written exam for passing level.

- **Oral exam** is **obligatory** for the students who earned ≥55% and ≤85% of the total score on the written exam. Students who earned 85% and more of the total score on the written exam are exempt from taking oral exam.

The final grade will depend on a grade given at the end of oral exam.

IV.b. GRADING CRITERIA

For passing the colloquiums and exams it is necessary to achieve a positive assessment of written part.

Grades will be determined on the basis of an objective standard of absolute difficulty of the test (called MPR) at:

≥85% of the total score on the test for excellence ,

75% of the total score on the test for very good,

65% of the total score on the test for good,

55% of the total score on the test for satisfactory.

IV.c. EXAM RESULTS:

Exam results will be posted on the Department of Physiology LMS page.

IV.d. ACADEMIC HONESTY

All students are expected to help to maintain an environment of academic honesty. The following behaviors are strictly forbidden during the administration of the exam: talking, cell phone use, and passing of papers or notes. All backpacks, coats, cell phones, etc. are to be placed in the front of the room.

All students are required to hand-in the packet of exam questions with their name clearly indicated on first page of the exam. It is the responsibility of the student to make sure that the answers he/she wants graded are clearly marked on the scantron sheet with a #2 lead pencil.

B. Types of examination and examination dates

Mandatory written small colloquiums: Integration I 03.02.2017. ; Integration II 14.02.2017.; Integration III 23.02.2017.; integration IV 09.03.2017.; Integration V 24.03.2017.

Mandatory written big colloquiums: Colloquium P1 07.02.2017.; Colloquium P2 28.02.2017.; Colloquium P3 28.03.2017.

Eligibility Criteria

The criteria for application to take the **final exam** are as follows:

For the final exam can apply:

- students who attended classes (seminars and practical) regularly,
- students who passed colloquium (for seminars and practical that were unattended)
- students who have signature in index for Physiology course

Colloquium for seminars and practical that were unattended is held by teachers who lead the seminar or practical that student did not attend.

The policy for colloquium:

- to be able to take colloquium student need to have the colloquium application sheet (student can get it in the room beside the practicum room)
- the teacher's signature in the colloquium application sheet is necessary to confirm that student successfully passed the colloquium.

To get index signed student must regularly attend classes and pass all colloquiums for classes unattended.

Examination dates

Regular terms **Date**

	03.04.2017.
Winter	08.12.2017. (Final exam for ac. year 2015./16. generation)
Summer	05.07.2017.
	20.07.2017.
Autumn	07.09.2017.
	21.09.2017.

V./I. LIST OF LECTURERS AND TEACHING STAFF

1. prof. dr. sc. Hrvoje Banfić
2. prof. dr. sc. Dora Višnjić
3. izv. prof. dr. sc. Mirza Žižak
4. izv. prof. dr. sc. Aleksandra Dugandžić
5. doc. dr. sc. Vladiana Crljen
6. doc. dr. sc. Vesna Lukinović-Škudar
7. doc. dr. sc. Tomislav Kelava
8. dr. sc. Hrvoje Lalić
9. Alan Šućur, dr. med.
10. Vilma Dembitz, dr. med.
11. Darja Flegar, dr. med.
12. Nikola Habek, dr. med.
13. doc. dr. sc. Marija Renić

V./II EXTERNAL ASSOCIATES:

V./III UNTENURED LECTURERS:

VI. LITERATURE

A. Obligatory

Guyton AC, Hall JE: Textbook Of Medical Physiology, 13th Edition, 2016.

B. Additional

(in alphabetical order):

W. Boron and E. Boulpaep. Medical Physiology 3rd Edition, ISBN: 9781455743773

R.M. Berne and M.N. Levy. Physiology 6th Edition, Mosby, 2009.

D.R. Bell. Core Concepts in Physiology. Lippincott-Raven, ISBN: 0-316-08868-4

Linda S. Costanzo Physiology: Board Review Series, Lippincott, Williams & Wilkins; 2nd edition

Reading Assignments:

Students are expected to read the assigned chapters prior to coming to class. The exams will draw heavily upon material discussed during lectures; however, students are still expected to master the material in the assigned chapters

NOTE:

MEF-Learning management System (MEF-LMS)

MEF-LMS is a platform designed to support teaching and learning at School of Medicine University of Zagreb.

MEF-LMS is used for the administration and delivery of the course materials, communication between students and teachers, students' self assessments

Physiology course materials will be available on the Physiology LMS page

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