UNIWERSYTET MEDYCZNY
IM. PIASTÓW ŚLĄSKICH WE WROCŁAWIU

Appendix 5
to Resolution No. 15630
of Senate of Wroclaw Medical University
of 30 March 2016

Syllabus 2019/2020

Description of the course

Module/Course	BIOLOGY OF AGING	Group of detailed education results	
		Group code B E	Group name Scientific basis of medicine, nonsurgical clinical sciences
Faculty	Medicine		
Major	medicine		
Specialties	Not applicable		
Level of studies	Uniform magister studies X * 1st degree studies ☐ 2nd degree studies ☐ 3rd degree studies ☐ postgraduate studies ☐		
Form of studies	X full-time ☐ part-time		
Year of studies	1st	Semester	☐ Winter X Summer
Type of course	☐ obligatory ☐ limited choice X free choice / elective		
Course	☐ major X basic		
Language of instruction	☐ Polish X English ☐ other		

* mark ☐ with an X

Number of hours

Form of education

Unit teaching the course	Lectures (L)	Seminars (SE)	Auditorium classes (AC)	Major Classes – not clinical (MC)	Clinical Classes (CC)	Laboratory Classes (LC)	Classes in Simulated Conditions (CSC)	Practical Classes with Patient (PCP)	Specialist Classes – magister studies (SCM)	Foreign language Course (FLC)	Physical Education obligatory (PE)	Vocational Practice (VP)	Self-Study (Student's own work)	E-learning (EL)
Winter Semester														
Summer Semester														
Division of Anatomy, Department of Human Morphology and Embryology, Faculty of Medicine, Wroclaw Medical University		10												

TOTAL per year:													
Division of Anatomy, Department of Human Morphology and Embryology		10											

Educational objectives (max. 6 items)

C1. To discuss the current views on aging, longevity and selected medical aspects of aging-associated diseases.

C2. To provide understanding of the links between aging and the wide spectrum of aging-associated diseases within the framework of modern theories of senescence.

C3. To promote critical thinking in students with respect to various emerging scientific theories and concepts as well as novel approaches in science and medicine, but especially in the science of aging, in order to test them.

Education result matrix for module/course in relation to verification methods of the intended education result and the type of class

Number of course education result	Number of major education result	Student who completes the module/course knows/is able to:	Methods of verification of intended education results (forming and summarizing)	Form of didactic class ***enter the abbreviation*
K 01	B.W28	discuss the fundamental concepts and theories of aging	written responses (final test)	SE, SS
K 02	B.W28 E.W8	explain how cells, organs and major organ systems change with age in humans	written response	SE
K 03	B.W28 E.W8	describe the changes that occur at the molecular, cellular and organism levels and their concomitant processes	written response	SE
K 04	B.W19 B.W22 B.W34	explain the role of selected factors and processes involved in the aging process as well as describe the principles of experimental research into the biology of aging	written response	SE
K 05	E.W9	characterize and discuss the links between aging and aging-associated diseases	written response	SE
S 01	E.U16 E.U25	lead a healthy lifestyle in order to postpone aging and reduce the risk of aging-associated diseases	oral response, practical test	SE, SS
S 02	E.U16 E.U25	seek and present new aspect theories and methods of research on aging	oral response, practical test	SE, SS
S 03	E.U25	develop new plans or approaches to test the current views and theories of aging	oral response, practical test	SE

S 04	B.W28 B.W34 E.U25	solve basic mathematical equations in respect of selected theories of senescence and their mathematical modeling	oral response, practical test	SE

** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .

Please mark on scale 1-5 how the above effects place your classes in the following categories:
communication of knowledge, skills or forming attitudes:
Knowledge: 5
Skills: 4

Student's amount of work (balance of ECTS points)

Student's workload (class participation, activity, preparation, etc.)	**Student Workload (h)**
1. Contact hours:	10
2. Student's own work (self-study):	3
Total student's workload	13
ECTS points for module/course	0.5
Comments	None.

Content of classes (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)

Seminars

1-2. Basic concepts of aging: definitions, models, methods and tools for studying aging as a dynamic and emergent biological phenomenon. The concept of homeostenosis, i.e. the loss of homeostasis and its underlying mechanisms.

3-4. Modern biological theories and concepts of senescence, including the evolutionary theories.

5-6. The hallmarks of aging. Aging at the molecular and cellular level. Oxidative damage. Mitochondrial dysfunction. Telomeres. Cellular senescence. Chronic low-grade systemic inflammation. Epigenetics of aging.

7-8. Inflammation and aging. Age-related diseases. Malleability and plasticity of aging. The role of biological determinants and selected modifiable components of lifestyle.

9-10. Perspectives on the biology of aging. The final test.

Basic literature (list according to importance, no more than 3 items)

1. Arking, R. (2019). *The biology of longevity and aging. Pathways and prospects. 4th ed.* New York: Oxford University Press.

2. Chmielewski, P. (2017). Rethinking modern theories of ageing and their classification: the proximate mechanisms and the ultimate explanations. *Anthropological Review*, 80(3), 259–272. *Open access.*

3. McDonald, R.B. (2013). *Biology of aging*. New York: Garland Science.

Additional literature and other materials (no more than 3 items)

1. Bilder, G.E. (2016). *Human biological aging: from macromolecules to organ systems*. New York: Wiley-Blackwell.

2. Chmielewski, P., Borysławski, K., Strzelec, B. (2016). Contemporary views on human aging and longevity. *Anthropological Review*, 79(2), 115–142. *Open access.*

Didactic resources requirements (e.g. laboratory, multimedia projector, other...)

Seminar room, multimedia projector, laptop and microphone.
Preliminary conditions (minimum requirements to be met by the student before starting the module/course) The essentials of biology, including evolutionary biology, and mathematics.
Conditions to receive credit for the course Course attendance is mandatory and strictly enforced. A student who misses any meeting or who arrives late or leaves early will not be eligible to take the final test and will not pass the course. As to dean's hours, rector's days and excused absences (i.e. when on sick leave but a sick note must be provided to cover the absence period and this can happen only once during the course), students must make up for each absence and they will write scientific essays on given topics according to the rules of academic writing, i.e. using the scientific language, referencing, etc. Students are expected to be very professional, responsible and polite. Based on the attendance rate (100%) and grades from essays (at least satisfactory), students will be eligible to take the final test. The test will cover both open and closed (e.g. multiple choice) questions from the fields of geroscience, cytogerontology, genetics, biochemistry, biophysics, bioenergetics, biodemography and mathematical modeling of senescence. To pass the test students have to score at least 60%.

Grade:	**Criteria for course** (points/results from the FT)
Very Good (5.0)	98-100%
Good Plus (4.5)	91-97%
Good (4.0)	81-90%
Satisfactory Plus (3.5)	71-80%
Satisfactory (3.0)	60-70%
Results that are lower than 60% are classified as 2.0.	

Grade:	**Criteria for exam (if applicable)**
Very Good (5.0)	
Good Plus (4.5)	
Good (4.0)	
Satisfactory Plus (3.5)	
Satisfactory (3.0)	

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Name of unit teaching course:	Division of Anatomy, Department of Human Morphology and Embryology, Faculty of Medicine, Wroclaw Medical University
Address	6a Chalubinskiego Street 50-368 Wroclaw, Poland
Phone	(71)784 13 30
E-mail	agnieszka.perlicka-lukaszun@umed.wroc.pl

Person responsible for course:	Piotr Paweł Chmielewski, PhD in Human Biology
Phone	(71) 784 13 45
E-mail	piotr.chmielewski@umed.wroc.pl

List of persons conducting specific classes:	*degree/scientific or professional title*	*Discipline*	*Profession*	*Form of classes*
Piotr Paweł Chmielewski, BSc, MSc, PhD	BSc, MSc, PhS in Human Biology	Human Biology, Anatomy	Anatomist, Academic teacher	SE

Date of Syllabus development

26/11/2019

Syllabus developed by

Piotr Paweł Chmielewski, PhD

Uniwersytet Medyczny we Wrocławiu
Katedra Morfologii Człowieka
ZAKŁAD ANATOMII PRAWIDŁOWEJ
p.o. kierownik
dr Zygmunt Domagała

Signature of Head of teaching unit

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Wroclaw Medical University
Faculty of Medicine
Vice-Dean for English Studies
prof. Beata Sobieszczańska, PhD

Signature of Faculty Dean

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