

<b>DEVELOPMENTAL BIOLOGY</b>	
<b>GENERAL INFORMATION</b>	
Course coordinator	Professor Marija Heffer MD, PhD
Assistant/Associate	Asst. Prof. Vedrana Ivić, PhD Marta Balog, PhD
Study Programme	Integrated undergraduate and graduate university study of Medicine
Status of the course	Elective
Year of study, semester	1th year, 2nd semester
ECTS	<b>2</b>
Workload (hours)	Lectures (5); Seminars (10); Exercises (10)
Expected number of students	30
<b>COURSE DESCRIPTION</b>	
<b>Course objectives</b>	
Strengthen the molecular concept of developmental processes as a basis for a rational approach to reproductive medicine, understanding the consequences of teratogenic factors, limitations within critical developmental periods, therapeutic interventions and the use of stem cell potential.	
<b>Enrolment requirements and entry competencies</b>	
Completed the course Medical Biology.	
<b>Learning outcomes at the Programme level</b>	
<b>1.1., 3.5.</b>	
<b>Learning outcomes (5-10)</b>	
<p>After completing the course and completing the exercises, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. List the molecular mechanisms of oogenesis, spermatogenesis and fertilization and place them in the context of diagnostic methods and therapeutic interventions of reproductive medicine.</li> <li>2. Describe the developmental mechanisms of blastulation, gastrulation and neurulation, link them to the time course of human pregnancy and assess the possible influence of environmental factors (diet, hormonal status, iatrogenic substances) on embryonic and fetal epigenetic processes.</li> <li>3. To connect the developmental potential of stem cells with the regeneration of the organism, the development of chronic diseases and aging.</li> <li>4. Recognize the stages of gametogenesis on histological preparations and connect them with diagnostic and therapeutic procedures in reproductive medicine and techniques of production of transgenic animals.</li> <li>5. Distinguish between embryonic and fetal developmental stages on histological specimens.</li> </ol>	
<b>Course content</b>	
<p><b>Lectures</b> Gametogenesis and fertilization from the perspective of reproductive medicine. Gastrulation - a critical developmental period for maintaining pregnancy. Influence of environmental factors on neural tube development. Intercellular communication in developmental processes. Stem cells, regeneration and aging.</p> <p><b>Seminars</b> Fertility problems in the human population. Development of the reproductive system in man. Neural tube developmental disorders. Evolution and developmental mechanisms. Twin</p>	

pregnancies.

#### **Exercises**

Reproductive system of animal models of rats and mice - spermatogenesis and oogenesis. How to make a transgenic animal? Developmental stages: blastula, gastrula and neurula. Developmental stages of the nervous system. Experimental embryology. Teratogenic malformations.

#### **Mode of teaching**

Lectures; Seminars; Exercises

#### **Student obligations**

Attendance at all forms of classes is mandatory, and the student must access all knowledge tests. A student may justifiably miss 30% of each form of instruction. Unfinished exercise must be colloquial.

#### **Monitoring student work (*alignment of learning outcomes, teaching methods and grading*)**

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Lectures	0,25	1-5	Class attendance	Record	6	12
Seminars	0,50	1-3	Participation in the discussion	Tracking activity	13	26
Excercises	0,25	4,5	Active participation	Record	6	12
Final exam	1	1-5	Learning for the written exam	Written exam	25	50
<b>Total</b>	<b>2</b>				<b>50</b>	<b>100</b>

*Evaluation of the written part of the final exam:*

Percentage of correct answers (%)	Grade points
60.00-69.99	25
70.00-79.99	35
80.00-89.99	40
90.00-94.99	45
95.00-100.00	50

*Calculation of final grade:*

Students who achieved 25 or more points in the final exam, the points obtained in the final exam are added to the grade points obtained during the class, and this sum constitutes the final grade. Since the study program schedule descriptive assessment of elective courses, the course coordinator awards the grade "passed" to a student who achieves 50 or more grade points in the course.

<b>Required reading (available in the library and through other media)</b>		
Title	Number of copies in the library	Availability through other media
1. Geoffrey M. Cooper i Robert E. Hausman: Stanica-Molekularni pristup, 5. izdanje, Medicinska naklada, Zagreb, 2010.	14	
2. Grup of authors: Handbook for Exercises in Medical Biology, J. J. Strossmayer University of Osijek, 2015.	30	
<b>Additional reading</b>		
1. Gilbert S.F.: Developmental biology. 11ed, Sinauer Associates, New York Oxford, 2018.		
<b>Course evaluation procedures</b>		
Anonymous, quantitative, standardized student survey on the subject and work of teachers conducted by the Office for Quality of the Medical Faculty Osijek.		
<b>Note /Other</b>		
E-learning is not included in the norm of subject hours, but it is used in teaching and contains links to various pages, video and audio materials available on the website.		