

<b>Study program:</b> Integrated Academic Studies in Pharmacy
<b>Course title:</b> Basics of Clinically Oriented Embryology
<b>Teacher:</b> Matilda A. Djolai, Dušan M. Lalošević, Ivan Dj. Capo, Bojana M. Andrejić Višnjić, Jelena R. Ilić Sabo, Jelena P. Amidžić, Aleksandra M. Levakov Fejsa, Dejan M. Miljković, Milan J. Popović
<b>Course status:</b> elective
<b>ECTS Credits:</b> 3
<b>Condition:</b> -
<p><b>Course aim</b></p> <p>Acquiring detailed knowledge and understanding of gametogenesis, <i>in vivo</i> fertilization along with retrospection and correlation with <i>in vitro</i> fertilization, embryo formation and fetal development with histological analysis of embryonic and fetal structures, ephasizing developmental malformations. Getting familiar with the application of clinically oriented embryology in gynecology, pediatrics, pathology and other areas of medicine (consequences, the possibility of medical care).</p>
<p><b>Expected outcome of the course:</b></p> <p>Upon completion of this course, students will gain basic knowledge in structure and needs of the conceptus, abnormal development of human embryo. Their knowledge of the normal and abnormal development in humans will be expanded greatly, which will be an important basis for understanding other familiar branches of medicine (gynecology, pediatrics, pediatric surgery).</p>
<p><b>Course description</b></p> <p><i>Theoretical education</i></p> <ol style="list-style-type: none"> <li>1. Introduction and history of reproductive biology – embryology as a science and basics of teratology</li> <li>2. Oogenesis</li> <li>3. Spermatogenesis</li> <li>4. Phases of fertilization <i>in vivo</i> and correlation with <i>in vitro</i> fertilization</li> <li>5. Blastomerization, implantation, gastrulation, formation of germ layers and neuralation</li> <li>6. Branchial system and development of the head and neck region of the embryo with possible malformations</li> <li>7. Development of cardiovascular system with possible malformations</li> <li>8. Development of digestive system with possible malformations</li> <li>9. Development of respiratory system with possible malformations</li> <li>10. Development of urinary system with possible malformations</li> <li>11. Development of reproductive system with possible malformations</li> <li>12. Development of endocrine system</li> <li>13. Development of nervous system and senses with possible malformations</li> <li>14. Development of musculoskeletal system and abdominal wall with possible malformations</li> <li>15. Development of placenta and its functions</li> </ol> <p><i>Practical education</i></p> <p>Microscopic analysis of human and animal material. Analysis of histological specimens of embryonal and fetal structures. Macroscopic analysis. Essay. Pre-exam review classes. Student's scientific papers.</p>
<p><b>Literature</b></p> <p><i>Compulsory</i></p> <ol style="list-style-type: none"> <li>1. Sadler T. Langman's medical embryology, 14<sup>th</sup> ed. Baltimore: Lippincott, Williams &amp; Wilkins; 2018. 456 p.</li> <li>2. Moore KL, Persaud TVN. The Developing human. Clinically oriented embriology. 10<sup>th</sup> ed. Philadelphia: Saunders; 2015. 560 p.</li> </ol> <p><i>Additional</i></p> <ol style="list-style-type: none"> <li>3. Singh V. Textbook of clinical embriology. Elsevere India; 2013. 352 p.</li> <li>4. Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. Larsen's human embriology, 5<sup>th</sup> ed. New York, Edinburgh: Churchill Livingstone; 2014. 576 p.</li> <li>5. Gilbert SF. Developmental biology. 8<sup>th</sup> ed. Sunderland: Sinauer Associates; 2006. 785 p.</li> <li>6. Keeling JW, Khong TY. Fetal and neonatal pathology, 5<sup>th</sup> ed. London: Springer; 2015. 882 p.</li> <li>7. Trounson A, Gosden R, Eichenlaub-Ritter U. Bilogy and pathologica oh the oocyte. Role in fertility, medicine and nuclear reprograming, 2<sup>nd</sup> ed. Cambrige: University press; 2013. 466 p.</li> <li>8. Ten Donkelaar HJ, Lammens M, Hori A. Clincinal neuroembriology. Development and developmental disordes of human central</li> </ol>

nervous system. 2<sup>nd</sup> ed. Berlin Heidelberg: Springer; 2006. 659 p.

<b>Number of active classes</b>	<b>Theoretical classes: 30</b>	<b>Practical classes: 15</b>	
<b>Teaching methods:</b> oral presentations and interactive lectures using multi-medial didactic tools and virtual microscopy. Practical work (individual or in small groups) through microscopic analysis of histologic specimens, and macroscopic analysis of relevant cases.			
<b>Student activity assessment</b> (maximally 100 points)			
<b>Pre-exam activities</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Lectures	30	Written	
Practices	10	Oral	60
Colloquium		.....	
Essay			