

Study program: Integrated academic studies in Pharmacy			
Type and level of the study program: integrated academic studies			
Course title: Fundamentals of clinically oriented embryology (PhII-COEM)			
Teacher: Matilda A. Djolai, Dusan M. Lalosevic, Ivan Dj. Capo, Bojana M. Andrejic Visnjic, Aleksandra M. Levakov Fejsa			
Course status: elective			
ECTS Credits: 3			
Condition: -			
Course aim Explanation of purpose and application of embryology in clinical practice with detailed 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. Getting familiar with the application of clinically oriented embryology in gynecology, paediatrics, pathology and other areas of medicine. Parallel to the theoretical knowledge about proper development and training of practical knowledge of normal embryology, the purpose of the subject is to explain the development of congenital malformations (teratology), to give a detailed explanation of their origin and mechanism of their appearance, as well as the importance of their recognition and practical issues (consequences, the possibility of medical care).			
Expected outcome of the course: Upon completion of this course, students will be trained to know in detail the structure and needs of the conceptus. Their knowledge on 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).			
Course description <i>Theoretical education</i> 1. Introduction and history of reproductive biology – embryology as a science and basics of teratology 2. Oogenesis 3. Spermatogenesis 4. Phases of fertilization <i>in vivo</i> and correlation with <i>in vitro</i> fertilization 5. Blastomerization, implantation, gastrulation, formation of germ layers and neuralation 6. Branchial system and development of the head and neck region of the embryo with possible malformations 7. Development of cardiovascular system with possible malformations 8. Development of digestive system with possible malformations 9. Development of respiratory system with possible malformations 10. Development of urinary system with possible malformations 11. Development of reproductive system with possible malformations 12. Development of endocrine system 13. Development of nervous system and senses with possible malformations 14. Development of musculoskeletal system and abdominal wall with possible malformations 15. Development of placenta and its functions <i>Practical education: exercises, other forms of education, research related activities</i> Microscopic analysis of human and animal material. Analysis of histological specimens of embryonal and fetal structures. Macroscopic analysis. Essay. Pre-exam review classes.			
Literature <i>Compulsory</i> 1. Moore KL, Persaud TVN. The Developing human. Clinically oriented embryology, 8 th ed. Saunders, 2008. 2. Sadler T. Langman's Medical Embryology. 12 th ed. Lippincott, Williams & Wilkins, Baltimore, 2012. 3. Singh V. Textbook of clinical embryology. Elsevier, 2012. 4. Schoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. Larsen's human embryology. 5 th ed. Churchill Livingstone, Elsevier. 2009. <i>Additional</i> 1. Gilbert S.F. Developmental biology. Sinauer Associates, Inc. USA 2003. 2. Keeling JW, Khong TY. Fetal and neonatal pathology, 4 th ed. Springer. 2007. 3. Trounson A, Gosden R, Eichenlaub-Ritter U. Biology and pathology of the oocyte. Role in fertility, medicine and nuclear reprogramming, 2 nd ed. Cambridge, University press. 2013. 4. Ten Donkelaar HJ, Lammens M, Hori A. Clinical neuro-embryology. Development and developmental disorders of human central nervous system. Springer, 2006.			
Number of active classes			Other:
Lectures: 30	Practice: 15	Other types of teaching: Research related activities:	
Teaching methods: 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.			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	10	Written	
Practices		Oral	60
Colloquium	30	
Essay			