ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН
1000 София
ул. „Сердика“ № 4
http://edu.bas.bg
email: tdc-phd@cu.bas.bg
тел.: 02 987 31 67
02 979 52 60

Basic Information:
Course Title: **EMBRYOLOGY**
Lecturer: assoc. prof. Dr Tanya Dimova, Institute of Biology and Immunology of Reproduction
Phone: 0882412742
Email: tanyadimova@yahoo.com
Total Teaching Hours: 30

Annotation (up to 150 words)
The course introduces doctoral students to the embryonic development of animals and humans. The objectives of the course are to study the processes of progenesis, growth, morphogenesis and cell differentiation during the embryonic development of organisms as well as some mechanisms in pathoembryology. The reasons and methods of assisted reproduction are examined. Doctoral students are introduced to the main topics of the three sections of embryology – general, special and applied embryology.

Course content (brief description by topics or modules)
Topic 1. Gametogenesis – oogenesis and spermatogenesis. Structure and function of gametes. Sexual cycle (ovarian and endometrial), ovulation, hormonal control. Fertilization and early stages of embryonic development.
Topic 2. Blastocyst and preimplantation events. Gastrulation. Implantation – phases and types of implantation
Topic 3. Endometrium and decidua. Hormonal regulation of the preparation of the endometrium for implantation and pregnancy. Pregnancy as a paradox and signals for its recognition.
Topic 4. Germ layers (bilaminar and trilaminar embryo). Development of the mesoderm and axial organs of the embryo. Derivatives of the mesoderm.
Topic 5. Transformation of the flat body of the embryo into a cylindrical one. Formation of the fetal membranes.
Topic 6. Placentation. Functions of the placenta. Types of placentas – classifications. Umbilical cord. Disorders of placentation.
Topic 7. Formation of body cavities. Formation and development of major organs of the nervous, endocrine and digestive systems.
Topic 8. Formation and development of the lung and heart. Anomalies in the development and maturation of the lung. Defects in the formation of the heart.
Topic 9. Formation and development of major organs of the immune, excretory and reproductive systems.
Topic 10. Applied embryology: Assisted reproduction and 3D modeling of implantation and early embryogenesis.

Teaching and assessment methods
The course is a series of lectures on general, special and applied embryology. Assessment is by exam on the lecture material.

Competencies acquired as a result of training (3–5 points)
Students who successfully complete the course:
1) know:
the basic characteristics of sex cells, the stages of fertilization and embryonic development in mammals, the mechanisms of implantation and placentation, critical periods in embryonic development and factors disrupting this development
2) can:
microscopically distinguish male and female gametes and trace the main stages in their differentiation, macroscopically and histologically distinguish the main types of placentas, explain the transformation of the embryonic body and the laying of individual organs and systems and define disorders in these processes.

Literature:
Textbook of Embryology. Haralampi Krastev, Stoyan Vitanov, Sofia 1994
Veterinary developmental anatomy - a clinical oriented approach.
Medical Histology and Embryology, Manas Das

Additional information (optional) (e.g., special requirements, laboratory equipment, prior knowledge)
The offered course is intended for doctoral students with knowledge of biology, including Zoology.